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EIGHTH ANNUAL REPORT

OF THE

SECRETARY

OF THE

Massachusetts Board of Agriculture,

TOGETHER WITH

REPORTS OF COMMITTEES

APPOINTED TO VISIT THE COUNTY SOCIETIES,

WITH AN APPENDIX

CONTAINING AN ABSTRACT OF THE

FINANCES OF THE COUNTY SOCIETIES,

FOR

1860.

BOSTON:
WILLIAM WHITE, PRINTER TO THE STATE.
1861.

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1882 1909

STATE BOARD OF AGRICULTURE.

1861.

MEMBERS EX OFFICIIS.

His Excellency JOHN A. ANDREW.
His Honor JOHN Z. GOODRICH.
Hon. OLIVER WARNER, *Secretary of the Commonwealth.*

APPOINTED BY THE GOVERNOR AND COUNCIL.

WILLIAM S. CLARK, *of Amherst.*
EPHRAIM W. BULL, *of Concord.*
MARSHALL P. WILDER, *of Dorchester.*

MEMBERS CHOSEN BY THE SOCIETIES.

Massachusetts,	RICHARD S. FAY, *of Boston.*
Essex,	GEORGE B. LORING, *of Salem.*
Middlesex,	JOHN B. MOORE, *of Concord.*
Middlesex, North,	JOHN C. BARTLETT, *of Chelmsford.*
Middlesex, South,	HENRY H. PETERS, *of Southborough.*
Worcester,	JOHN BROOKS, *of Princeton.*
Worcester, West,	FREEMAN WALKER, *of North Brookfield.*
Worcester, North,	JABEZ FISHER, *of Fitchburg.*
Worcester, South,	OLIVER C. FELTON, *of Brookfield.*
Worcester, South-East,	HENRY CHAPIN, *of Milford.*
Hampshire, Franklin and Hampden,	MOSES STEBBINS, *of South Deerfield.*
Hampshire,	LEVI STOCKBRIDGE, *of Hadley.*
Highland,	MATTHEW SMITH, *of Middlefield.*
Hampden,	GEORGE M. ATWATER, *of Springfield.*
Hampden, East,	SHERMAN CONVERSE, *of Monson.*
Franklin,	JAMES S. GRENNELL, *of Greenfield.*
Berkshire,	HENRY COLT, *of Pittsfield.*
Housatonic,	SAMUEL H. BUSHNELL, *of Sheffield.*
Hoosac Valley,	JOSEPH WHITE, *of Williamstown.*
Norfolk,	CHARLES C. SEWALL, *of Medfield.*
Bristol,	NATHAN DURFEE, *of Fall River.*
Plymouth,	CHARLES G. DAVIS, *of Plymouth.*
Barnstable,	GEORGE MARSTON, *of Barnstable.*
Nantucket,	EDWARD W. GARDNER, *of Nantucket.*
Martha's Vineyard,	CHARLES B. ALLEN, *of West Tisbury.*

CHARLES L. FLINT, *Secretary.*

EIGHTH ANNUAL REPORT

OF THE

SECRETARY

OF THE

BOARD OF AGRICULTURE.

To the Senate and House of Representatives of the Commonwealth of Massachusetts.

At the close of my last Annual Report, I alluded to the fact that an alarming disease among cattle had broken out in certain sections of this Commonwealth, which threatened to affect most seriously the prosperity of our agriculture. That disease had been introduced into this country in importations of cattle from the continent of Europe, where it had been shown to be contagious and fatal in the highest degree. More than one government had, by neglect on its first appearance, suffered it to get beyond control, and the loss of millions of dollars was the consequence. It was, therefore, an evil of sufficient magnitude to command the prompt action of the legislature, to eradicate it entirely from our own stock, or at all events to prevent it, if possible, from becoming a national calamity.

After very great delays incident to legislation, during which the disease was rapidly gaining ground, a commission was established for the purpose of exterminating it, and an appropriation of ten thousand dollars placed at the control of the commissioners by an Act signed by the governor on the fourth of April. So rapid had been its progress, however, and so numerous had been the exposures of sound animals to the infection, that the most energetic measures were required, and the appropriation was soon exhausted without having fully accomplished the object for which it was made. Under the circumstances it was deemed advisable to call an extra session of the State Board of Agriculture to meet at the State House on the 15th of May. At this meeting, Dr. Loring, as one of the commissioners, laid before the Board the following

MEMORIAL.

To the Massachusetts State Board of Agriculture:

The Commissioners appointed under the Act of the legislature of Massachusetts to extirpate the disease called Pleuro-Pneumonia, now existing in certain towns in the Commonwealth, have been for several weeks endeavoring to accomplish the work assigned them. The difficulties under which they labored at the outset were very great. The disease had existed for many months in the locality to which it had been transplanted. By sales and exchange of animals, it had been scattered abroad throughout a section of country whose chief business is agriculture, and where the isolation of many of the farms rendered it difficult to trace it. The delay incident to legislation, had complicated and extended the trouble. An entire insufficiency of funds appropriated for the purpose, checked the work of extermination and the unexpected extent of territory which contained the infection, and through which the Commissioners have been obliged to feel their way, rendered their task perplexing and burdensome to the highest degree. They found, moreover, that beyond a narrow circuit where the disease had done its work of actual destruction, the public mind was not aroused to a sense of the danger. The farmers who were more remote from the scene of the catastrophe were reposing in confidence, and were even congratulating themselves upon their safety, while they were daily inviting the incendiary to their homesteads. Nothing but a series of facts, established with great labor and delay by the Commissioners, aroused them to a full sense of their danger. And it was not till the certainty of the infection was demonstrated beyond a doubt that they remembered how carelessly they had purchased animals from the original seat of the disease, or had worked their teams in connection with those belonging to a distempered herd, or had fed their cattle in infected stables, or had paused by the roadside to discuss with a neighbor the condition of some sickly creature which was then breathing death into the nostrils of its dumb companions.

The difficulties which existed in the outset have not diminished, as the work has gone on, and its extent has opened. Where there was at first apathy there is now alarm. The calls to investigate districts where the slightest suspicion rests, are incessant. Discoveries of recent exposure are numerous; and already the Commissioners fear that, in spite of their untiring efforts to pursue every animal that can possibly have carried the disease with him, and to extirpate every vestige of his path, some may have escaped them, and have carried the disease beyond their reach. In addition to this, herds that have been confined through the winter are now roaming over the pastures, and unless the infection is checked at once, no man can tell the devastation which must attend its course as it goes on from one enclosure to another, eluding the strictest vigilance and defying the most careful investigation.

In spite of all obstacles, the Commissioners have not hesitated to go to the fullest extent of their powers in the discharge of their duty. They have destroyed all that gave the slightest appearance of disease, from the poor man's single cow to the large and choice collections of the most extensive farmers. They have explored every spot which has been brought to their notice as having been in any way exposed, and have endeavored to ascertain the limits beyond which it seems impossible that the disease can have progressed.

The central point of the infected district, it is well known, is North Brookfield, the farm of Leonard Stoddard, into which the disease was thoughtlessly and innocently introduced, and from which it has been allowed carelessly, to go out. Around this spot the destruction is complete; but few animals, indeed, being left in the unfortunate town. The disease has been discovered in the north, in those parts of New Braintree, Oakham and Rutland, lying contiguous to North Brookfield; on the east, in Spencer; on the south, in Brookfield and Sturbridge, and on the west, in West Brookfield, Ware, and Warren. It is believed that the precise course and extent of the disease have been explored in each of those towns.

The number of persons whose cattle have been condemned or destroyed, is 75. The number of animals already marked or killed, is 750.

The Commissioners wish they could assure the Board of Agriculture and the community that their work will end here. But they cannot. The fire that is wasting prairie and forest may apparently be quenched for a time, and it is only when, on the distant horizon, its terrific work is painted, and heaven and earth seems all ablaze, that the insidious and appalling power of the illusive element comes home to the heart of its pursuers.

This is not the time nor the place to enter into an investigation of the history and character of the disease—that, it is hoped, may be done hereafter. But it is important that the public should know and appreciate the full extent of the contagion. That the disease is peculiar to itself there can be no doubt whatever. The name Pleuro-Pneumonia, which has been applied to it, and which in its ordinary acceptation signifies inflammation occupying the pleura and lung at the same time, does not by any means indicate its true character. The inflammatory stage of the disease is hardly perceptible. But throughout the substance of the lungs, and in the membrane covering them and lining the cavity of the chest, there seems to have been diffused a morbific poison, under the influence of which the vitality of the parts is threatened with speedy destruction. The contagion is inevitable. Wherever an animal has been exposed, in that animal the disease is sure to be found. Every creature that went from Leonard Stoddard's herd carried the malady with him, and imparted it wherever he went. In no case has an animal been examined on account of its history, that the disease has not been found in a greater or less degree. In whatever herd the disease exists, the animal that carried it there can be pointed out, and his exposure traced back to that wretched calf that went from Belmont to North Brookfield. The disease is not epidemic. It is not found except as the result of contagion. It has broken out in no spot without a known and well authenticated cause. But it passes from animal to animal in its deadly career, marking every victim that comes within its fatal grasp as surely as the water of Tofana or the poison of Brinvilliers.

To keep the plague within its present limits, and to draw a cordon around the infected district, is now the great object of the Commissioners—a work which the nature of the disease renders practicable, and which nothing but public apathy and inaction will prevent. They have only to ask that public sentiment will sustain them in staying the ravages of an enemy which, once allowed to roam unrebuked, would strike a destructive blow at the great industry of our country—that industry upon which we all depend, and whose security from panic and crisis is exemplified by the everlasting hills upon which it rests. Standing upon the high lands of the diseased region, the beholder can cast his eye over miles of beautiful swelling pastures, the richest, by far, in our State, where roam thousands of cattle, the solid wealth and active force in the agriculture of an industrious people. The destroyer has laid its hand upon the very heart of his victim. In no section of our State could the consequences of his reign be so disastrous as in that which he now threatens; and in none is the opportunity for his progress so great. The soul sickens at the thought of his escape; for should his sway become supreme, and north and south, east and west, mountain and prairie and savannah, hill and valley, own his sceptre, who can tell the consequences? To say that millions would be lost in a business whose profits are counted by units; to say that fear and despair would take the place of hope and security, is to tell but half the story. For in our very homes with the nourishment upon which our lives depend, we should daily bring the seeds of disease and decay. Let those who would charge the Commissioners with recklessness of animal life, remember this, and know that when the task of extermination is abandoned in despair, if abandoned it is, a rich and prosperous country is delivered over to blight and a curse; to the "pestilence which walketh in darkness, and to the destruction which wasteth at noonday."

That this is no exaggerated picture, let the present condition of the towns and farms already visited by the disease bear witness. Stripped of the vital force which gave existence to their agriculture, they present the sad and mournful picture which nature always spreads over the deserted haunts of man. Farming without cattle—a ship without sails, a mill without machinery, a city without inhabitants, the world without man. Of those held in suspense, too, the condition is scarcely less wretched; with a prospect before them of a constant struggle against disease, in which the expense and risk of cattle-husbandry are increased a hundred fold, and the present safety and vigor of health are exchanged for an enfeebled condition.

In discharging their duty, the Commissioners desire the aid and counsel of those interested in agriculture. With a very few exceptions, they have found the farmers immediately affected by the disease, prompt to act in its suppression, and ready to impart any information necessary to a thorough accomplishment of the work. The advice and sympathy of many of the agricultural societies have been given through their agents who have visited the spot. Liberal contributions have been made to a guaranty fund, to provide against any delinquency which it seems impossible should occur in the action of any future legislature toward compensating the sufferers from this terrible calamity.

It seems proper, that, in addition to this, the State Board of Agriculture should make such recommendations as may prevent the progress of the disease, and should sustain the Commissioners by all means in their power. It is highly important that suggestions should be made to the several societies with regard to suspending their exhibitions of cattle the coming autumn; and that an effort should be made to induce each society to relinquish its annual appropriation from the State, for the purpose of rendering the financial burden as light as possible.

It is for these and other reasons that the Commissioners have called the attention of the Board to the subject, with the assurance that their call will not be in vain, and with the belief that no subject has been brought before them more important in all its bearings, or more entitled to prompt and energetic action.

(Signed.)
PAOLI LATHROP,
AMASA WALKER,
GEORGE B. LORING,
Commissioners.

NORTH BROOKFIELD, May 15, 1860.

A committee was appointed to coöperate with the commissioners, who entered at once upon their duties; but the want of funds adequate to the exigencies of the case was calculated to embarrass their operations, and render it doubtful whether the disease could be arrested.

Public sentiment demanded an extra session of the legislature. This was called to meet on the 30th of May. The number and powers of the commissioners were enlarged, and a Medical Board established for the examination of the disease. The Act passed at this session, and approved by the governor on the 12th of June, required that the report of the commissioners and of the medical board should appear in this volume.

These reports, submitted to the legislature on the 10th of January, are as follows:

REPORT

OF THE COMMISSIONERS APPOINTED FOR THE EXTIRPATION OF THE DISEASE AMONG CATTLE, CALLED PLEURO-PNEUMONIA.

To the Senate and House of Representatives of the Commonwealth of Massachusetts.

In submitting this Report, as required by the Act under which they were appointed, the Commissioners propose to confine themselves, almost exclusively to a narrative of facts, believing that such a course will be most acceptable to the legislature, and most useful to the public. In doing this, they will be obliged to repeat some things already published.

On the 29th day of February, 1860, a petition was presented to the legislature of this Commonwealth, signed by sundry inhabitants of North Brookfield, praying that a law might be enacted for the extirpation of a disease amongst cattle, then raging in that town and its neighborhood. This was followed by petitions of a similar import from New Braintree, signed by Samuel Mixter and others; from Hardwick, signed by Joseph Powers and others; and from Barre, signed by Edward Denny and others. A memorial in behalf of the Massachusetts Society for the Promotion of Agriculture, for the same object, was also presented.

These petitions were referred to the Committee on Agriculture; and several distinguished gentlemen, connected with the agricultural interest, appeared before the committee, in aid of the petitioners, urging the necessity of immediate legislation.

On the 21st day of March, "Resolves, in relation to a contagious disease amongst cattle, in the towns of North Brookfield and New Braintree," were presented by Mr. Eldridge, of the Committee on Agriculture, which, after discussion, were recommitted. March 23d, the same were reported in a new draft, entitled, "Resolves, to prevent the spread of the disease, called Pleuro-Pneumonia, amongst the cattle of this Commonwealth." March 25th, the Resolves were read a second time, and laid upon the table. March 28th, they were taken from the table, and amended, by substituting a "Bill to extirpate the disease, called Pleuro-Pneumonia amongst cattle;" which passed its several stages, and was approved April 4th. It was as follows:

AN ACT

TO PROVIDE FOR THE EXTIRPATION OF THE DISEASE CALLED PLEURO-PNEUMONIA, AMONG CATTLE.

Be it enacted, &c., as follows:

SECT. 1. The governor is hereby authorized to appoint three commissioners, who shall visit without delay the several places in this Commonwealth, where the disease among cattle, called pleuro-pneumonia, may be known or suspected to exist, and shall have full power to cause all cattle belonging to the herds in which the disease has appeared, or may appear, or which have belonged to such herds since the disease may be known to have existed therein, to be forthwith killed and buried, and the premises where such cattle have been kept, cleansed and purified; and to make such order in relation to the further use and occupation of such premises as may seem to them to be necessary to prevent the extension of the disease.

SECT. 2. The commissioners shall cause all cattle, in the aforesaid herds, not appearing to be affected by the disease, to be appraised before being killed, at what would have been their fair market value if the disease had not existed; and the value of the cattle thus appraised shall be allowed and paid out of the treasury of the Commonwealth to the owner or owners thereof.

SECT. 3. Any person who shall knowingly disregard any lawful order or direction of said commissioners, or who shall sell or otherwise dispose of an animal which he knows, or has good reason to suspect has been exposed to the aforesaid disease, shall forfeit a sum not exceeding five hundred dollars.

SECT. 4. The commissioners shall make a full report to the secretary of the board of agriculture, of their proceedings, and of the result of their observations and inquiries relative to the nature and character of the disease.

SECT. 5. The commissioners shall duly certify all allowances made under the second section of this act, and other expenses incurred by them, or under their direction, in the execution of their service, to the governor and council; and the governor is hereby authorized to draw his warrant therefor upon the treasury.

SECT. 6. This act shall take effect from its passage, and continue in force for the term of one year thereafter, and no longer.—[*Approved April* 4, 1860.

From the foregoing statements, it will appear that from the first presentation of the subject to the legislature, to the final passage of the law, was an interval of thirty-five days. This delay, and consequent loss of time, was most unfortunate, and cost the Commonwealth a great part of the entire amount expended under this commission. Had the law, as was hoped, been enacted, within one week after the petitions were presented, the whole work of extirpation might have been fully accomplished, while the herds were in winter quarters.

On the 6th of April, Paoli Lathrop, of South Hadley; Richard S. Fay, of Lynn; and Amasa Walker, of North Brookfield, were appointed Commissioners to carry out the provisions of the law, and entered upon their duties five days after. The circumstances which induced the different towns to move for the enactment of the foregoing law were essentially as follows.

On the 29th of June, 1859, Mr. Curtis Stoddard, of North Brookfield, bought of Mr. Winthrop W. Chenery, of Belmont, three calves, which he brought by rail to West Brookfield, and thence to his farm in North Brookfield. On the way from the depot one of the calves was observed to falter, and in two or three days became very sick. Mr. Leonard Stoddard, father of Curtis Stoddard, thinking that he could cure the calf, carried it to his own barn, in which were about forty head of cattle. The calf grew no better and after four days young Stoddard took it back to his own premises, where in about ten days it died. About a fortnight after the calf left Leonard Stoddard's farm one of his oxen that had been fed in the barn where the calf was kept became sick and died after a two weeks' illness. Two weeks after this, another ox sickened and died, and another, and another, until thirteen oxen and cows had died, and as subsequently appeared, his whole stock had become greatly diseased.

Mr. Curtis Stoddard lost no animal by infection, that is, none died on his hands, up to the date of the commission. But the sick calf, while it lived, had been kept in such a position that a large part of his stock, consisting of twenty head or more, were brought into near contact with it, and thus were exposed to infection. By this statement it will be seen that from the very commencement two distinct centres of infection were formed: one at the younger Stoddard's, who brought the diseased calf from Belmont, the other at his father's, where the same calf had been kept for four days. The latter centre proved to be far the most disastrous and fatal, as will be seen in the progress of the narrative.

Mr. Leonard Stoddard kept many oxen and was engaged largely in the transportation of wood, timber, &c. Of course his cattle were constantly on the road, and often brought into contact with animals belonging to other herds. He was also a large dealer in cattle, often buying, selling and exchanging. Although his cattle began to die in August, no suspicions of the contagious nature of the disease seem to have been entertained, and on the 15th of October he sold a cow to C. P. Huntington, of North Brookfield, about two miles distant, who had a herd of twenty cows and two oxen. Not long after the purchase of this cow, it sickened and died, and one after another of his cows were attacked, until he had lost eight animals, while as many more gave evidence of disease. This established another centre of infection, from which the disease spread in the neighborhood.

On or about the 1st of December, Leonard Stoddard sold a yoke of oxen to his neighbor, Mr. Alden Olmstead. These cattle were apparently in health, and no suspicions were entertained in regard to them. Mr. Olmstead kept them in his barn for five days with a herd of more than twenty head, and then exchanged them with Mr. William F. Doane, who lives a mile distant. In a short time Mr. Olmstead's cattle became sick and successively died, until he had lost about one-third of them, and the remainder were greatly, many of them fatally diseased.

Mr. Leonard Stoddard also sold an animal to Mr. A. A. Needham, of New Braintree. The result was, Mr. Needham's herd of twenty-three head became greatly diseased and died rapidly, until he had lost about a third part of them, and the rest had become badly infected. Mr. Leonard Stoddard often passed the barn of A. B. Woodis and fed his oxen in Woodis' barn, whose cattle, about twenty in number, began to sicken and die, until his herd was in as bad a condition as that of Mr. Needham.

Such in general were the facts, when on the eleventh of April last, the Commissioners entered upon their duties. Only the five herds already mentioned, namely, those of Leonard Stoddard, Alden B. Woodis, A. A. Needham, Alden Olmstead and C. P. Huntington, were certainly known to be diseased. Curtis Stoddard's cattle had been previously disposed of, chiefly at an auction, held on the 2d of November, and though not then known to be diseased, were subsequently found so; some of them very badly.

After visiting the above herds and satisfying themselves that the disease existed in all of them, the Commissioners decided on the following course of action. Since none of their number, as the commission was then organized, were men of medical science, or had any knowledge of the disease, beyond their present observation, they determined to employ the best veterinary surgeons of the Commonwealth, to advise with themselves, to decide what animals "appeared to be diseased," before being killed; and to make such post mortem examinations as would throw light on the nature and symptoms of the disease. Both these points seemed of importance, that it might be intelligently determined what animals were to be paid for according to law; and that the public might gain a knowledge of the fatal malady.

Accordingly, Dr. E. F. Thayer and Dr. George H. Dadd, well known veterinary surgeons of Boston, were selected, and gave their attendance at most of the examinations made throughout the proceedings of the commission. Drs. O. Martin and J. N. Bates, of Worcester, George N. Bates, of Boston, and Warren Tyler, of North Brookfield, all of the regular medical profession, were also in attendance at many of the examinations. Other gentlemen of the profession were present at different times as spectators.

The first step in regard to any suspected herd was to order an examination by the surgeons. If they decided that the disease existed in the herd, they were next directed to select from the whole number "such as appeared not to be diseased." The whole herd was then slaughtered. Those which had been condemned before as "appearing to be diseased," were not paid for; the rest were. By this course of procedure, all disputes and differences with the owners were prevented. The whole question was referred to those who were believed to be most competent to decide it; and the subsequent action of the Commissioners was regulated by their Report.

In examining and disposing of the first five herds, in which the pleuro-pneumonia was so very conspicuous, the Commissioners discovered that certain other herds had been greatly exposed; and had begun to exhibit marked symptoms of the disease. For example, the neat stock of Mr. Lewis E. Hill, (occupying a farm adjoining that of Leonard Stoddard,) which had run, during the last fall feed, in fields only separated from Stoddard's cattle by a common fence, or stone-wall, were evidently sick. Examinations were at once made; very severe cases were found, the herd was condemned, and in some instances the autopsies showed conclusively that Mr. Hill's cattle were in the same general condition with those of his neighbor. The same was found to be the case, though not in a degree as strongly marked, with the cattle of Mr. John Hill, which had a similar connection with Stoddard's. The cattle of

Mr. S. H. Bigelow, whose farm lay near that of Mr. C. P. Huntington, were found in a bad condition. Their greatest, though not the only exposure, is believed to have been from Huntington's sick cattle, driven at different times past the barnyard in which Bigelow's oxen had been kept. This case of Bigelow was regarded as a very alarming one, showing the exceeding contagiousness of the disease; for if the herd could be so fatally infected, under such circumstances, it was almost certain that the disease had been extensively propagated.

Another fact of great significance was soon presented. We have already mentioned that Leonard Stoddard sold a yoke of oxen to Mr. Olmstead, who, after keeping them for five days, sold them to W. F. Doane. A few days afterwards, namely, on December 19th, Mr. Doane joined them with a team of twenty-four yoke of oxen, to remove a building from Oakham to North Brookfield. Investigation satisfied the surgeons that nearly all the cattle connected with this large team took the infection, and communicated it to the different herds to which they belonged. This opened a wide field of exposure, and caused the destruction of many cattle.

Another cause of extensive mischief, was the sale and dispersion of Curtis Stoddard's herd by the auction before alluded to. These cattle were purchased by several different persons; and, at the time, appeared well. No suspicion was felt by purchaser or seller, that any contagious disease was here concealed. This was evident from the readiness with which bids were made; and, from the fact, that Mr. Stoddard reserved the most valuable animals of his stock, which, as he was breaking up his farm-establishment, he placed, for keeping, in the herds of his friends, his father, his father-in-law, and his uncle. It proved, however, when investigation was made, that the disease did exist extensively among these cattle. When killed, some of them, especially his own, were found to be deeply infected.

The Commissioners used their best efforts to trace out all cases of exposure; and, so far as possible, to exterminate all herds in which the disease was clearly manifested; the latter being a question which they always referred to their professional advisers. They were resolved to execute the law in the most efficient manner; and to extirpate the disease, if that were possible.

Under these circumstances, the Commissioners had proceeded but two weeks, when one of their number, R. S. Fay, Esq., much to the regret of his colleagues, having pressing engagements, resigned his commission. A few days after, Dr. George B. Loring, of Salem, was appointed in his place.

The work was then continued, with great assiduity; but the ramifications of the disease were found to be vastly more extensive than was first supposed. All these were traced as far as the Commissioners could determine, to their utmost limits; and wherever, in the opinion of the surgeons, and their own best judgment, the disease was found to exist, even in the incipient stage, the herd was condemned, and disposed of. As these cases multiplied, the labors of the Commissioners became more arduous; although, in almost every case, they received the hearty assistance of those whose herds were involved in these operations.

They had, however, proceeded in their work but a few weeks, when it became painfully evident, that the appropriation made by the legislature ($10,000) was altogether inadequate to the work assigned them. No time, however, was to be lost, if the work were to be done at all. The cattle would soon leave their stalls, and be scattered upon a thousand hills, where, if the material for contagion existed, it would soon be so widely diffused, that all attempts at extermination would be futile.

An agreement was, therefore, drawn up, of which the following is a copy:—

> "The undersigned hereby agree, that if the Commissioners appointed to extirpate the disease amongst cattle, see fit, in the discharge of their duty, to kill any or all of the cattle belonging to our respective herds, we will wait for our compensation for the same if necessary, until the legislature shall make additional appropriations for the purpose; provided, however, that in case the legislature fail to make such appropriations, we retain our claim upon the guarantee fund, which has already been, or which may hereafter be subscribed for that purpose."

This agreement was very readily and generally signed by those whose cattle were supposed to be infected. The Commissioners did not feel disposed, however, even with this permission on the part of owners, to proceed in their work without some assurance that the cattle destroyed should ultimately be paid for; and they accordingly proposed to some of the agricultural societies, and leading friends of agriculture, to open a subscription, which should guarantee, that if the legislature failed at its next session to make the requisite appropriations, they would, respectively pay the sums set against their names, to indemnify the owners.

In answer to this appeal, the following, amongst other subscriptions, were received:—

> "Believing it to be of the highest importance that the fatal disease amongst cattle, known as pleuro-pneumonia should be at once and fully extirpated; and that the sum of $10,000 appropriated for that purpose by the legislature, is adequate thereto, (the Commissioners not having power to go beyond that sum,) the undersigned hereby agree to be held responsible to said Commissioners, to the amount set against our respective names, so that, in case the next legislature does not appropriate the necessary amount to meet the expenses incurred by the Commissioners aforesaid, we agree to be assessed *pro rata*, upon our subscriptions, for the balance."

(Signed)

Trustees of the Massachusetts Society for Promotion of Agriculture, by Thomas Motley, Jr.,	$2,000
Henry H. Peters,	1,000
H. A. Rice,	100
George W. Lyman,	200
John G. Tappan,	100
Samuel Cooper,	100
Albert Ballard,	100
Caleb T. Fay,	100
Andrew J. Peters,	100
Josiah Stickney,	100
Andrew Pierce,	100
J. W. Paige,	100
Josiah Quincy, Jr.,	100
William Buckminster,	100
O. Bennett,	100
E. F. Knight & Co.,	100
Benjamin D. Godfrey,	300
A. Andrews,	100
Abiel S. Lewis,	100
George Baty Blake,	$100
Marshall P. Wilder,	100
E. P. Tileston,	100
Edm. Munroe,	100
Joseph Burnett,	500
Moses G. Cobb,	100
Charles McBurney,	100
Abbott Lawrence,	100
Nourse, Mason & Co.,	100
W. H. Sampson,	100
Lee Claflin,	100
Isaac Stickney,	100
George B. Sampson,	100
Thomas Motley, Jr.,	100
Franklin King,	100
James H. Jenks,	100
S. F. Alderman,	100
John Hunt,	100
William A. Phipps,	200
Thomas Corey,	100
J. A. Fairweather,	100
Plymouth Ag. Society,	200

Many other subscriptions were made in different parts of the State, amounting it is supposed, to $15,000 to $20,000. Fortified and encouraged by these spontaneous expressions of confidence, from that class most deeply interested, the Commissioners continued their efforts until the twentieth of May, when it became evident that the altered circumstances in which they were placed, required a change of policy. The cattle were now generally in the pastures, scattered far and wide, over several towns, and numbering in all, more than a thousand head, which had been more or less exposed to contact with animals that were at least suspected. It seemed to the Commissioners that the disease was nearly extirpated; but the danger that great numbers of cattle *might have it in a latent form*, appeared, judging from experience, to be imminent. It seemed unwise to kill animals on mere suspicion; yet, if the disease was to be entirely removed, not a single case must be left from which it could be propagated. If these suspected herds could be placed under restraint, be guarded and watched, and if necessary, isolated until it would be fully determined that they were free from the disease, a great many cattle might be saved and yet the public made secure.

Furthermore, the Commissioners had already exceeded the appropriation by $15,000; and although the owners of cattle killed had, as before stated, agreed to wait for compensation until another session of the legislature, it would be to them a very great hardship since they needed their pay in order to re-stock their farms with horses to take the place of oxen for labor; and with sheep for their pastures instead of cows.

Under these circumstances the Commissioners determined to request the governor to call an extra session of the legislature. In this matter they received the co-operation of numerous petitions from different towns in the Commonwealth, and from the committee of the State Board of Agriculture. Until the legislature should assemble and take action on the subject, the Commissioners determined to take the responsibility to cease the killing of any additional herds, and so far as in their power, to secure the public from all further exposure, by such isolation as they could effect in the absence of the requisite legal authority.

The legislature met on the thirtieth of May; and the entire history of the case was presented to the large and able committee to which the matter was referred. Numerous persons gave evidence in relation to the disease, amongst them many gentlemen of the medical faculty; and after long and careful consideration, the following law was enacted and received the sanction of the executive on the twelfth of June.

AN ACT

CONCERNING CONTAGIOUS DISEASES AMONG CATTLE.

SECTION 1. The selectmen of towns and the mayor and aldermen of cities, in case of the existence in this Commonwealth of the disease called pleuro-pneumonia, or any other contagious diseases among cattle, shall cause the cattle in their respective towns and cities, which are infected, or which have been exposed to infection, to be secured or collected in some suitable place or places, within such city or town, and kept isolated; and when taken from the possession of their owners, to be maintained, one-fifth of the expense thereof to be paid by the town or city wherein the animal is kept, and four-fifths at the expense of the Commonwealth, such isolation to continue so long as the existence of such disease or other circumstances renders the same necessary.

SECT. 2. Said selectmen and mayor and aldermen, when any such animal is adjudged, by a veterinary surgeon or physician by them selected, to be infected with the disease, called pleuro-pneumonia, or any other contagious disease, may, in their discretion, order such diseased animal to be forthwith killed and buried at the expense of such town or city.

SECT. 3. Such selectmen and mayor and aldermen shall cause all cattle which they shall so order to be killed, to be appraised by three competent and disinterested men, under oath, at the value thereof at the time of the appraisal, and the amount of the appraisal shall be paid as provided in the first section.

SECT. 4. Said selectmen and mayor and aldermen are hereby authorized to prohibit the departure of cattle from any enclosure, or to exclude cattle therefrom.

SECT. 5. Said selectmen and mayor and aldermen may make regulations in writing to regulate or prohibit the passage from, to, or through their respective cities or towns, or from place to place within the same, of any neat cattle, and may arrest and detain at the cost of the owners thereof, all cattle found passing in violation of such regulations, and may take all other necessary measures for the enforcement of such prohibition, and also, for preventing the spread of any such disease among the cattle in their respective towns and cities, and the immediate vicinity thereof.

SECT. 6. The regulations made by selectmen and mayor and aldermen, in pursuance of the foregoing section, shall be recorded upon the records of their towns and cities respectively, and shall be published in such towns and cities in such manner as may be provided in such regulations.

SECT. 7. Said selectmen and mayor and aldermen are authorized to cause all cattle infected with such disease, or which have been exposed thereto, to be forthwith branded upon the rump with the letter P, so as to distinguish the animal from other cattle; and no cattle so branded shall be sold or disposed of except with the knowledge and consent of such selectmen and mayor and aldermen. Any person without such knowledge and consent, selling or disposing of an animal known to be affected with such disease, or known to have been exposed thereto within one year from such sale or disposal, shall be punished by fine not exceeding five hundred dollars, or by imprisonment not exceeding one year.

SECT. 8. Any person disobeying the orders of the selectmen or mayor and aldermen, made in conformity with the fourth section, or driving or transporting any neat cattle contrary to the regulations made, recorded, and published as aforesaid, shall be punished by fine not exceeding five hundred dollars, or by imprisonment not exceeding one year.

SECT. 9. Whoever knows, or has reason to suspect the existence of any such disease among the cattle in his possession or under his care, shall forthwith give notice to the selectmen of the town or mayor and aldermen of the city where such cattle may be kept, and for failure so to do, shall be punished by a fine not exceeding five hundred dollars, or by imprisonment not exceeding one year.

SECT. 10. Any town or city whose officers shall neglect or refuse to carry into effect the provisions of section one, two, three, four, five, six, and seven, shall forfeit a sum not exceeding five hundred dollars for each day's neglect.

SECT. 11. All appraisals made under the provisions of this act shall be in writing, and signed by the appraisers, and the same shall be certified to the governor and council, and to the treasurer of the several towns and cities wherein the cattle appraised belong, by the selectmen and mayors and aldermen respectively.

SECT. 12. The selectmen of the towns and mayor and aldermen of the cities, are hereby authorized, when in their judgment it shall be necessary to carry into effect the purposes of this act, to take and hold possession, for a term not exceeding one year, within their respective towns and cities, of any land, without buildings other than barns thereon, upon which it may be necessary to enclose and isolate any cattle, and they shall cause the damages sustained by the owners in consequence of such taking and holding to be appraised by the assessors of the town or city wherein the lands so taken are situated, and they shall further cause a description of such land, setting forth the boundaries thereof. and the area as nearly as may be estimated, together with said appraisal by the assessors, to be entered upon the records of the town or city. The amount of said appraisal shall be paid as provided in the first section, in such sums and at such times as the selectmen or mayor and aldermen respectively may order. If the owner of any land so taken shall be dissatisfied with the appraisal of said assessors, he may, by action of contract, recover of the town or city wherein the lands lie, a fair compensation for the damages sustained by him; but no costs shall be taxed, unless the damages recovered in such action, exclusive of interest, exceed the appraisal of the assessors. And the Commonwealth shall reimburse any town or city four-fifths of any sum recovered of such town or city in any such action.

AN ACT

IN ADDITION TO AN ACT CONCERNING CONTAGIOUS DISEASES AMONG CATTLE.

SECTION 1. In addition to the commissioners appointed under the provisions of chapter one hundred and ninety-two of the acts of the year one thousand eight hundred and sixty, the governer, by and with the advice and consent of the council, is hereby authorized to appoint two additional persons to constitute, with those now in office, a board of commissioners upon the subject of pleuro-pneumonia, or any other contagious disease now existing among the cattle of the Commonwealth.

SECT. 2. When said commissioners shall make and publish any regulations concerning the extirpation, cure, or treatment of cattle infected with, or which have been exposed to the disease of pleuro-pneumonia, or other contagious disease, such regulations shall supersede the regulations made by selectmen of towns and mayors and aldermen of cities, upon the same subject matter, and the operation of the regulations made by such selectmen and mayors and aldermen shall be suspended during the time those made by the commissioners as aforesaid shall be in force. And said selectmen and mayors and aldermen shall carry out and enforce all orders and directions of said commissioners, to them directed, as they shall from time to time issue.

SECT. 3. In addition to the power and authority conferred on the selectmen of towns and mayors and aldermen of cities, by the act to which this is in addition, and which are herein conferred upon said commissioners, the same commissioners shall have power to provide for the establishment of a hospital or quarantine in some suitable place or places, with proper accommodations of buildings, land, &c., wherein may be detained any cattle by them selected, so that said cattle so infected and exposed may be there treated by such scientific practicioners of the healing art as may be there appointed to treat the same. And for this purpose said commissioners may take any lands and buildings in the manner provided in the twelfth section of the act to which this is an addition.

SECT. 4. The governor, by and with the advice and consent of the council, is hereby authorized to appoint three competent persons to be a board of examiners to examine into the disease called pleuro-pneumonia, and who shall attend at the hospital at quarantine established by the commissioners mentioned in the foregoing section, and there treat and experiment upon such number of cattle, both sound and infected, as will enable them to study the symptoms and laws of the disease and ascertain, so far as they can, the best mode of treating cattle in view of the prevention and cure of the disease, and who shall keep a full record of their proceedings, and make a report thereon to the governor and council, when their investigations shall have been concluded: *provided*, that the expense of said board of examiners shall not exceed ten thousand dollars.

SECT. 5. The selectmen of the several towns, and the mayors and aldermen of the several cities, shall, within twenty-four hours after they shall have notice that any cattle in their respective towns and cities are infected with or have been exposed to any such disease, give notice in writing to said commissioners of the same.

SECT. 6. The commissioners are authorized to make all necessary regulations for the treatment, cure and extirpation of said disease, and may direct the selectmen of towns and mayors and aldermen of cities to enforce and carry into effect all such regulations as may, from time to time, be made for that end; and any such officer refusing or neglecting to enforce and carry out any regulation of the commissioners, shall be punished by fine not exceeding five hundred dollars for every such offence.

SECT. 7. The commissioners may, when in their judgment the public good shall require it, cause to be killed and buried, any cattle which are infected with, or which have been exposed to said disease, and said commissioners shall cause said cattle to be appraised in the same manner provided in the act to which this is an addition; and the appraised value of such cattle shall be paid, one-fifth by the towns in which said cattle are kept, and the remainder by the Commonwealth.

SECT. 8. Whoever shall drive or transport any cattle from any portion of the Commonwealth east of Connecticut River to any part west of said river before the first day of April next, without consent of the commissioners, shall be punished by fine not exceeding five hundred dollars, or by imprisonment in the county jail not exceeding one year.

SECT. 9. Whoever shall drive or transport any cattle from any portion of the Commonwealth into any other State before the first day of April next, without the consent of the commissioners, shall be punished by fine not exceeding five hundred dollars, or by imprisonment in the county jail not exceeding one year.

SECT. 10. If any person fails to comply with any regulation made, or with any order given by the commissioners, he shall be punished by fine not exceeding five hundred dollars, or by imprisonment not exceeding one year.

SECT. 11. Prosecutions under the two preceding sections may be prosecuted in any county in this Commonwealth.

SECT. 12. All appraisals made under this act shall be in writing and signed by the appraisers and certified by the commissioners, and shall be by them transmitted to the governor and council, and to the treasurers of the several cities and towns wherein the cattle appraised were kept.

SECT. 13. The provisions of chapter one hundred and ninety-two of the acts of one thousand eight hundred and sixty [except so far as they authorize the appointment of commissioners] are hereby repealed, but this repeal shall not affect the validity of the proceedings heretofore lawfully had under the provisions of said chapter.

SECT. 14. The commissioners and examiners shall keep a full record of their doings, and make report of the same to the next legislature, on or before the tenth day of January next, unless sooner required by the governor; and the said record, or an abstract of the same, shall be printed in the annual volume of Transactions of the State Board of Agriculture.

SECT. 15. The governor, with the advice and consent of the council, shall have power to terminate the commission and board of examiners whenever, in his judgment, the public safety may permit.

The additional Commissioners required by the Act, Messrs. Cyrus Knox, of Palmer, and E. G. Morton, of Fairhaven, were not appointed until the 2d of July. They entered on their duties the 6th of that month. During the interval between the adjournment of the legislature and the appointment of additional Commissioners, those already in office were placed in circumstances of great embarrassment. They did not feel at liberty to inaugurate the new policy required by the law just enacted, without the sanction of the full board of Commissioners contemplated by that law; and they could do little more than keep things as they were, until their new colleagues should be ready to act with them. This state of things gave rise to considerable uneasiness in the neighborhood where the disease had existed, occasioning great inconvenience, and in some cases, serious losses.

The Commissioners now proceeded to isolate and secure the suspected herds as effectually as possible. They killed but very few animals, and these mostly either to ascertain whether or not, the disease existed in certain herds; or to exterminate such as, from their connection with animals well-known to be diseased, were considered dangerous. The most vigilant watch was kept upon all herds supposed to be infected. The towns in the central and westerly parts of Worcester County, generally adopted and published stringent regulations, in accordance with the law "respecting contagious diseases among cattle;" and these, so far as known, were executed with commendable promptness and fidelity, until the approach of cold weather, and the apparent absence of the disease, rendered such precautions unnecessary.

It had been feared, that with the approach of cold weather, the disease would again manifest itself. Such has been the case in other countries; and such, we had reason to apprehend, would be the case here, unless the disease had been entirely exterminated; a consummation, which, however much desired, could not with certainty be calculated upon. Thus far, there have been no new instances of the disease; and it is now confidently hoped that its extermination has been complete, with the exception now to be mentioned.

It has been already stated that the pleuro-pneumonia was brought to North Brookfield from the herd of Winthrop W. Chenery, Esq., of Belmont; but no account has yet been given of the manner in which the disease was introduced into his herd, the consequences that followed, nor the subsequent action of the Commissioners.

According to the statement of Mr. Chenery, before the committee appointed at the extra session, he imported three cows and one heifer from Holland, which arrived at Boston May 23d, 1859. Two of the three cows were in bad condition when landed. The first died at the end of a week. The second cow died two days afterwards. About the 20th of June, the third cow was found to be sick. She was kept with some twenty or thirty head of cattle, in a room fifty feet square. She died on the 29th of June. This was the day on which the three calves were taken from Mr. Chenery's farm to North Brookfield. Another cow was found to be diseased in

August. She had been imported from Holland in 1852. She died in about a fortnight. From that time, his cattle died successively, until about the first of November, when he had lost in all about thirty head. See Evidence, etc., page 75, *et seq.*, Extra Session, 1860.

Although your Commissioners began their operations in North Brookfield and New Braintree, they soon extended their examinations to the herd at Belmont. They first visited that place on the 16th of April, five days after their appointment. Mr. Chenery expressed the belief "that all his animals were now sound, or recovering; for he had lost none for a long time, and all seemed in a thriving state." The Commissioners, from their experience in Worcester County, had a strong belief that, however well Mr. Chenery's cattle might appear externally, an autopsy would present results similar to those observed in other places, and accordingly three animals were killed. Post-mortem examinations by Drs. Thayer, Dadd, and George N. Bates, showed that all these animals were greatly diseased. They presented the same general appearances with the worst cases at North Brookfield, only of longer standing. Though the Commissioners were thus confirmed in their opinion, that the greater part of this herd were fatally diseased, they took no measures for the disposal of them. The reasons for this course were three. First, the cattle were in a safe and isolated situation, and there was no danger of their communicating the infection. Second, many of Mr. Chenery's cattle were valued by him at very high prices, which, if allowed, would absorb a great part of the very limited resources at the disposal of the Commissioners. A third reason was, that the imminently perilous condition of the herds in North Brookfield and its vicinity, which were daily extending the infection, required the constant and undivided attention of the Commissioners and the surgeons.

Under these circumstances, therefore, no steps were taken for the disposal of Mr. Chenery's cattle, and no more of them were killed, until the 2d of June, when, during the extra session, two were slaughtered and examined, both of which were found diseased. Soon after the enlargement of the Board of Commissioners, a consultation was had with the Board of Medical Examiners, appointed under the same Act, in regard to the propriety of reserving a part of Mr. Chenery's herd for experiment, and of using his barn and premises as the hospital in which to make the investigation contemplated by said Act. On consultation with Mr. Chenery, and in accordance with his wishes, it was determined that he should select ten of the animals most valuable to himself, and most likely to be free from disease; and that the balance, twenty-seven in number, should be appraised and disposed of in such manner as the two Boards should see fit. Accordingly, on the 4th of August, three gentlemen, Messrs. George W. Lyman, R. S. Fay, and J. W. Underwood, were appointed for the purpose, and duly appraised the twenty-seven head to be taken on behalf of the Commonwealth.

On the 25th of September the Medical Commissioners, attended by Messrs. Lathrop and Walker, of the other Board, met at Belmont. Four animals were killed. The first two were sound. The others were found so diseased, that, in the opinion of the Medical Commissioners, there was no safety in allowing any of this herd to mix with other animals, and they recommended that the whole should be ultimately destroyed.

Another meeting was held at Belmont on the 12th of October, when seven animals were killed and examined. Of these, two only were found diseased. The others were sound; but some of them were calves, dropped subsequent to the severity of the disease in Mr. Chenery's herd.

The whole Board again met on the 16th of October, and made a post-mortem examination of six more of these cattle. Three of them were sound, the others diseased. Of the seventeen animals disposed of in these examinations by the Medical Board, nine were decidedly diseased with the pleuro-pneumonia.

Only ten of the animals taken by the Commissioners then remained alive, and from these four were taken by the Medical Board for experiment, as they should judge best, which, together with the four animals killed on the 25th of September, were, by mutual agreement, charged to the account of that Commission.

On the 13th of December, the Commissioners and Medical Examiners again met at Belmont, and killed three more of Mr.

Chenery's herd, two of which were diseased. Mr. Chenery then took back the three animals remaining, which had been appraised.

The Medical Examiners, at this time, killed one of the animals in their possession, and found it diseased.

There remained at the close of these operations sixteen animals out of the original stock of Mr. Chenery, viz. thirteen belonging to himself, and three under the charge of the Medical Board. It has been determined by the Commissioners to keep these animals isolated until such time as it will be prudent to set them at large in the Commonwealth, from a desire to avoid all possibility of exposure, all unnecessary destruction, and all expense in their power.

In addition to the foregoing it may be proper to state, that after the examination made on the 25th of September when four animals were killed under the direction of the Medical Examiners, they sent a communication to this Board, expressing their opinion that there was no safety to the public except by the extermination of Mr. Chenery's herd, and recommending that course in the final disposition of them.

In this connection, the Commissioners would say that wherever the disease had been exterminated, they have recommended and insisted upon a thorough disinfecting of the building, in which the cattle have been kept. This, it is believed, has been uniformly and very thoroughly done, by cleansing out all filth and offal from the premises, by washing the floors and ceilings with alkalies, by white-washing and the use of McDougall's Patent Disinfecting Powders, an article that has been highly recommended by the most distinguished chemists of Europe, and found highly efficacious and convenient.

The Commissioners do not regard it as within their province to speak at length of the pathology of the disease, with which they have been called to contend. The appointment of a Medical Board of Examiners for the purpose of inquiring into "the symptoms and laws of the disease, and the best mode of treating cattle in view of its prevention and cure," renders such a service quite unnecessary, if not improper. Another reason why they should not enter upon a service so strictly professional, is found in the fact, that the extended examinations made by the committee of the extra session, and the numerous autopsies and other facts reported in the "Evidence" before referred to, published by that committee, render a further treatment of this subject, by this Board, superfluous.

Certain clear and practical conclusions to which the Commissioners have arrived, in view of the facts under their observation, they feel it incumbent on them explicitly to state:—

1st. That the disease is strictly contagious, no case having occurred where it was not directly and indisputably traceable to contact with some animal known to be diseased.

2d. That the severity or virulence of the disease is in proportion to the closeness of contact; that where animals are confined in barns, they take the disease from each other, in the most aggravated form; the more close or air-tight the barn or stable, the more rapid the development of the disease.

3d. That cleanliness, ventilation, and the use of disinfectants are important, as means of preventing the spread of the disease amongst a herd in which it exists, and of modifying its character.

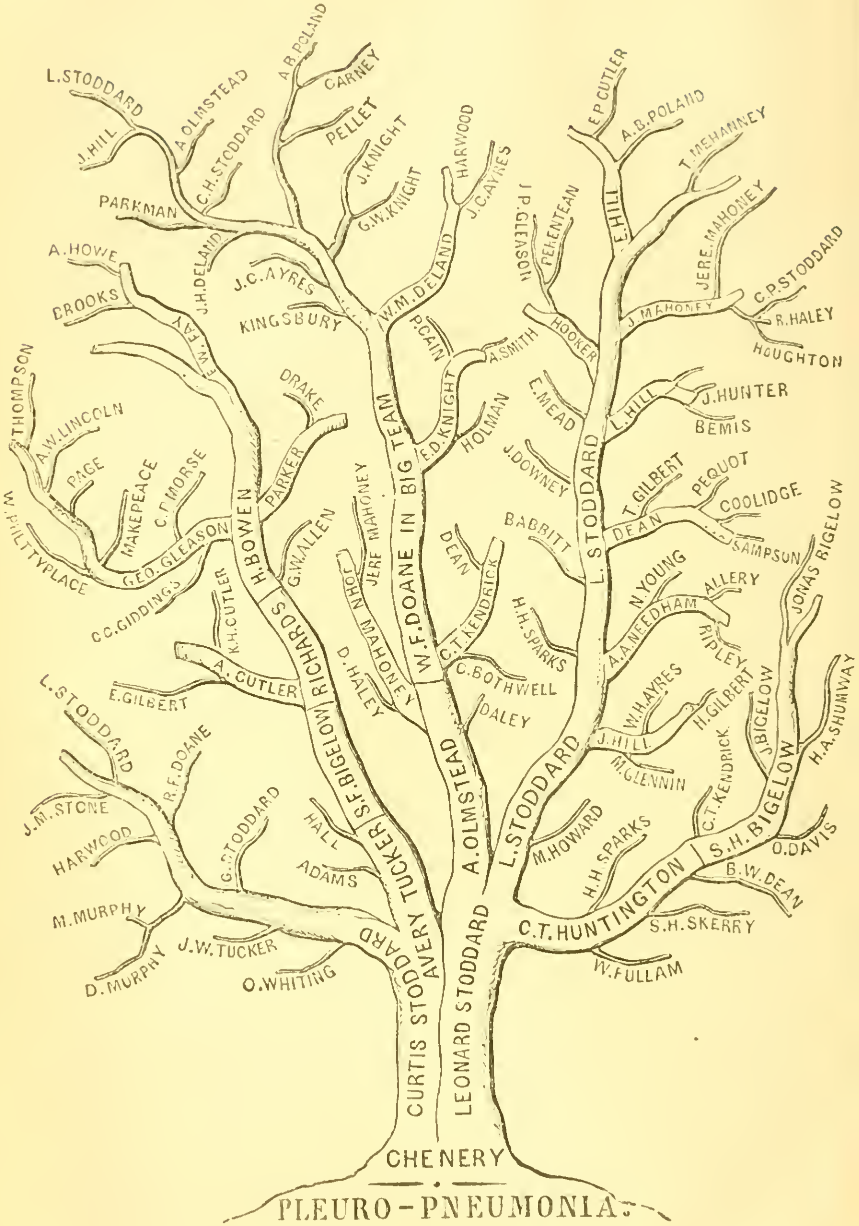
4th. That the disease, as it always, in the end, produces ulceration of the lungs, is hopelessly incurable.

The annexed diagram, carefully prepared from the records of the commission, will establish, it is believed beyond cavil, the first of the foregoing propositions. It is intended to show the connection of every case with the original infection; and to exhibit not only every well-defined instance of disease, but also those cases where animals were so far implicated by exposure, as to make them, in the opinion of the surgeons, dangerous, and were therefore condemned and destroyed.

The endeavor has been, to make this chart, or diagram, as complete as possible, and it is believed that there is no essential omission or mistake.

It will be seen, on examination, that certain names are inserted two or more times, upon the chart. This is explained by the fact, that the herds of such persons were exposed to infection in several ways. [See next page.]

At the time of the breaking out in this country of the disease, called pleuro-pneumonia, but little was known respecting it, even by veterinary surgeons. Not one of these, it is believed, had ever seen a case of it. Its laws were not understood, and consequently the Commissioners were compelled to act very


L.STODDARD
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CARNEY
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G.W.KNIGHT
HARWOOD
J.C.AYRES
J.H.DELAND
A.HOWE
J.C.AYRES
KINGSBURY
W.M.DELAND
BROOKS
F.W.FAY
E.P.CUTLER
A.B.POLAND
T.MEHANNEY
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JERE.MAHONEY
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R.HALEY
HOUGHTON
HOOKER
PICARD
A.SMITH
E.D.KNIGHT
HOLMAN
E.MEAD
L.HILL
J.HUNTER
BEMIS
THOMPSON
A.W.LINCOLN
PAGE
MAKEPEACE
C.F.MORSE
DRAKE
PARKER
H.BOWEN
W.F.DOANE IN BIG TEAM
J.DOWNEY
L.STODDARD
T.GILBERT
PEQUOT
COOLIDGE
DEAN
SAMPSON
JONAS BIGELOW
W.PILTTYPLACE
GEO.GLEASON
C.C.GIDDINGS
K.H.CUTLER
G.W.ALLEN
JERE MAHONEY
JOHN MAHONEY
RICHARDS
DEAN
C.T.KENDRICK
BABBITT
N.YOUNG
ALLERY
A.A.NEEDHAM
RIPLEY
H.H.SPARKS
A.CUTLER
E.GILBERT
D.HALEY
C.BOTHWELL
DALEY
W.H.AYRES
H.GILBERT
J.HILL
M.GLENNIN
J.BIGELOW
H.A.SHUMWAY
C.T.KENDRICK
L.STODDARD
R.F.DOANE
J.M.STONE
HARWOOD
S.F.BIGELOW
HALL
G.STODDARD
ADAMS
TUCKER
A.OLMSTEAD
L.STODDARD
M.HOWARD
H.H.SPARKS
S.H.BIGELOW
O.DAVIS
B.W.DEAN
M.MURPHY
D.MURPHY
J.W.TUCKER
O.WHITING
AVERY
C.T.HUNTINGTON
S.H.SKERRY
W.FULLAM
CURTIS STODDARD
LEONARD STODDARD
CHENERY
PLEURO-PNEUMONIA.

much in the dark. That the disease was terribly fatal, seemed to be sufficiently demonstrated by the death of nearly one-half of Mr. Chenery's stock, in a few months, on its first appearance. That it was contagious, was clearly proved by its having been carried to North Brookfield, from Belmont, in the manner described, and spreading there from herd to herd, in all cases by contact, and raging with equal virulence as at Belmont. But how the infection was communicated, how long the disease was in incubation, at what stage of the disease infection could be communicated, or when the time arrived that it ceased to be communicable, all these important facts were then unknown. The perplexity caused by their want of knowledge in regard to the disease, is easily perceived. On its appearance in any herd, there was no course of safety, but to destroy the whole, as required by law; for no one could say that there was any security in leaving a single animal alive, that had been exposed, however lightly. It was quite apparent that it was better a whole herd should perish, than one be left to spread disease over the Commonwealth.

The difficulty of determining clearly, by prognosis, when the disease actually existed, greatly embarrassed the surgeons and Commissioners. Yet they were compelled to act, and act promptly, and in such manner as the public safety required.

The total expense incurred by the commission, large as it may seem to some, is small, when compared with the immensity of the object to be gained. The whole cost will not amount to one-half of one-per cent. on the total value of the neat stock of Massachusetts. What country in Europe, where the disease permanently exists, would not pay a vastly greater premium *every year*, to be defended from this terrible scourge?

The whole amount for which warrants have been drawn upon the treasury on account of this commission, is	$28,755 32
The outstanding bills for various expenses, are about	5,000 00
	$33,755 32

In addition to the above estimate, Mr. Chenery has a just claim for the board of his animals from May thirteenth to June twelfth, amounting to a little more than three hundred dollars; but the provisions of the law of April fourth do not authorize the Commissioners to approve it. They doubt not, however, that the legislature, whenever the subject shall be brought before them, will provide for its payment. It may be proper to add, that Mr. Chenery has presented a claim for damages he thinks he has suffered from proceedings held under the law. The Commissioners not having authority to adjust such a claim, the matter will probably be brought before your honorable body by petition.

From the foregoing statements it will appear, that the expenditures of this Board have been much less than it was at one time feared they would be.

Animals pronounced sound and killed, under Act of April 4 :—			
Cows,	197		
Heifers,	103		
Oxen,	89		
Steers,	78		
Yearlings and calves,	164		
Animals not described,	48		
		679	
Animals pronounced diseased and killed, under Act of April 4,			160
Animals killed, paid for under Act of June 12 :—			
Cows,	10		
Heifers,	7		
Oxen,	2		
Steers,	2		
Yearlings and calves,	5		
Animals not described,	5		
		31	
Total of animals to be paid for			710
Total of animals killed by the Commission,			870

In addition to which, five have been killed by the medical examiners.

While the Commissioners are well satisfied that the law of April 4, 1860, under which by far the greater part of the operations of this Board were conducted, was just and liberal in its provisions, they could not but observe with regret, that some cases of great hardship necessarily resulted from the execution of it. Such cases if hereafter brought to the attention of the legislature will, it is not doubted, receive the consideration to which they may be entitled.

The Commissioners cannot dismiss the subject now before them without referring to the reports that have been frequently circulated of the existence of pleuro-pneumonia in other places than those already specified. These reports they regard as entirely erroneous. They do not believe that a single case has occurred in New England not connected with the herd of Mr. Chenery. Their reasons for this opinion are first, that from an examination of many of the reported cases, and from the description of others, they are fully satisfied they are of an entirely different character. Those at Farmington, Connecticut, for example, were generally supposed to be cases of the genuine disease; but Dr. Warren Tyler of North Brookfield, who has probably seen as many cases of the real pleuro-pneumonia as any man in this country, and who visited Farmington in company with Mr. Commissioner Lathrop, at the request of the commissioners of the State of Connecticut, became fully convinced by careful post mortem examination, that they were not the exudative pleuro-pneumonia. Another reason for disbelief in the genuineness of these, is, that in no instance, so far as known have they proved contagious. They have been sporadic cases, in different parts of this and the adjoining States. So far as known to the Commissioners they resemble each other in their developments; but none of them answer to the disease imported by Mr. Chenery.

The case of an ox belonging to Mr. Hubbard Peckham of Petersham, was one of the most extraordinary. The animal was not known to have been exposed to contagion. First symptoms of disease appeared April first. Was seized during a stormy day grating his teeth, afterwards frothing at the mouth, and at times coughing badly. The first attack lasted three days, continued to work, although he did not fill himself, until the twentieth of May; after that time he declined, though somtimes better. On the twentieth of July at the close of a hot day was much worse, and continued sick until the twenty-third, when he was killed by his owner.

His lungs were found to be a mass of disease, no part being sound. The whole weighed sixty-four pounds, being filled with tuberculous formations from the size of a pea to that of a hen's egg. These tubercles were filled with corrupted matter, which seemed to have been generally deposited throughout the lungs. The animal was examined by Dr. Taylor of Petersham, who kindly sent statements concerning them to the Commissioners. Dr. Tyler of North Brookfield, examined the samples of lung sent, and decided that it was a case of pneumonia of the same type as that exhibited at Farmington, Conn.

It is thought unnecessary to dwell longer on this part of the subject, as it is one which comes especially within the province of the medical examiners, and will doubtless receive due consideration at their hands.

It may be proper to mention in this connection, that the existence of pleuro-pneumonia in this Commonwealth, arrested the attention of the people and governments of several States. The governor of Ohio on the twentieth of May, appointed a delegation consisting of Messrs. John H. Klippart, Sullivan D. Harris, and Robert Thompson, to visit Massachusetts and " ascertain the history of the introduction of the disease, its diagnosis, &c." Mr. Klippart and Doctor Thompson visited the infected district, and so far as possible, in that late stage of the operations of the commission, made the required investigations. On their return they submitted an elaborate report to the governor, which has been published.

Kentucky was represented by the attendance of Doct. S. M. Bemis, Registrar of Louisville.

The Governor of Illinois issued his proclamation on the 22d of June, appointing Doct. Andrew McFarland, of that State, a commissioner to make investigations in regard to the disease; and recommending " that all farmers, drovers, merchants, and citizens generally, of the State of Illinois, shall not purchase or import into this State, any cattle already subject to or infected with this disease, or which have been in any way exposed to such contagion, or from any State or region of country where such disease exists or is supposed to exist, or into which the same is liable to be spread by reason of its contiguity to the infected districts;" and he further "recommended and requested all owners, officers and agents of steam-boats, canals, and railroads, and all common carriers of stock, to refuse to transport any cattle into this State, which may be so diseased, or infected, or suspected of the same, or which may come from such infected or suspected districts."

Doct. McFarland visited Massachusetts, and after diligent research, made a very interesting report of the results of his mission, a published copy of which has been received by this Board.

The Governor of Maine, on the 28th of May, appointed Messrs. S. L. Goodale, Secretary of the State Board of Agriculture, Doct. Amos Nourse, and Doct. E. Holmes, commissioners to visit this State. These gentlemen were present at the extra session of the legislature; and after making personal observations of the mode of procedure adopted by your Commissioners, made an able report of their doings to the governor of Maine, a printed copy of which is in the hands of this commission.

The attention of the legislature of Connecticut was called to this subject, during the month of May. The prevalence of the disease on the very confines of that State, rendered some efficient action necessary; and a board of commissioners, consisting of Messrs. Charles Matthewson, Lonzo M. Smith, and John L. Stewart, were appointed under authority of the legislature. These gentlemen visited this Commonwealth, some of them several times, and took a deep interest in all matters connected with the extirpation of the disease. Governor Buckingham, of that State, was present at post mortem examinations, made under the direction of your Commissioners, on the 26th of June last.

A visit was also made by the Secretary of the New York State Agricultural Society, B. P. Johnson, Esq., and by other gentlemen of that State, interested in agriculture.

Delegations also from Pennsylvania and Indiana visited Massachusetts for information in regard to the disease in question.

The executive committee of the New Jersey State Agricultural Society met on the 5th of June last, and after a discussion of the subject, [pleuro-pneumonia,] appointed a committee, two of whom, N. N. Halstead, president of the society, and Mr. Benjamin Haines, visited Boston in company with Doctors J. M. Ward and G. Grant, of Newark. The latter gentlemen acted as medical commissioners, and on their return submitted a report, from which, as it contains many very important facts in relation to the disease as those gentlemen believe it exists or has existed in New Jersey and New York, it is thought advisable to make the following extract.

The disease was introduced into Brooklyn by a cow imported from Germany in 1843, and taken directly from ship-board into one of the large *milk* dairies of that city. In the county of Kings the disease has lurked until the present time, making its incursions into other parts of the country as opportunities to convey it have offered, by the transfer of some animal from an infected herd.

In 1853 the disease was carried by a cow to Mr. Prentice's farm at Mt. Hope, near Albany; a cow originally from the dairy of Mr. P., after wintering in Brooklyn, was being returned to him, bearing the disease with her. Thus introduced into his herd, it extended from one animal to another, not ceasing to do its work until such a perfect separation of the animals was affected, that not more than two, in most cases but one animal was kept in a place. Early impressed with the conviction that the disease was of a contagious character, and that his future security was in prevention and not in remedy, Mr. Prentice resorted to a quarantining of the sick and a rigid isolation of the remainder, as above detailed, and thus controlled the disease.

On the testimony of Mr. Johnson, the disease was carried to his farm, near Newark, by animals which he purchased in the New York market. Sickening soon after their arrival, the disease was first communicated to animals in the contiguous stalls, and from them to others, till all the cattle on the farm have been the subject of it. Isolation has not been resorted to here, and the whole history cannot now be written, for much seed we fear has been sown that when ripened into harvest may give us a sad appendix. The history of the other outbreaks of the disease in New Jersey, viz., in the herd of Mayor Edgar, at Rahway, and others in Morris County, if written, would be in corroboration of what we have here given.

Second. Its identity is proclaimed by a similarity of symptoms, marking the period of incubation, development, progress and termination of the disease in all the localities in which it has been observed. The description given by Mr. Prentice of the disease in his herd was as like to that of Mr. Johnson as language can portray disease. When the disease, as it appeared in the Johnson herd, witnessed by your commission, was described to the veterinary surgeons at Boston, they declared it at once identically the same. Not one symptom noted in the sick here but has been observed in Mr. Johnson's animals.

The post mortem examinations declare quite unequivocally their identity. The same engorged condition of the lungs, producing an increase in the size of the organ that would seem almost incredible to one who has not witnessed it, as well as of *weight*, from five to twenty and thirty pounds and upwards; the same hepatizations, adhesions, serous effusions and prevalent deposits in *abcesses* and *cysts*, have been observed wherever examinations have been made.

And *thirdly*, in the fatality of the disease. Mr. Chenery's herd consisted of sixty animals, of which thirty have died; Mr. Prentice's, thirty-one, of which sixteen died; Mr. Johnson's, about twenty, of which a little more than half died.

It may not be unimportant to observe, inasmuch as it has been claimed that the *Dutch* animal is particularly obnoxious to the disease, from the hereditary predisposition acquired from the disease having prevailed in Holland over 200 years and thus tainted the stock, that the percentage of *loss* in the Dutch herd of Mr. Chenery was a fraction less than in Mr. Prentice's *Ayrshires;* while that in the native stock of Mr. Johnson has exceeded that of both. Quite as great has been the percentage of loss in other native herds in Brooklyn and New Jersey, teaching us that no breeds of horned cattle are exempt from the disease.

And lastly, and that to which your commission would attach the greatest importance in their report, in view of its practical bearing upon public interests, is their profound conviction that it is most virulently contagious. If there is any reliance to be placed on human testimony, every case of the disease that has occurred in Massachusetts can be traced from animal to animal, step by step, through the Stoddard and Chenery herds to cows imported from Holland. This fact was indisputably established in the investigation made by the committee of the Massachusetts legislature (see printed documents, extra session.) The disease in Kings County it is admitted, was introduced by the imported cow from Germany that sickened soon after her arrival and destroyed the dairy into which she was introduced. With equal certainty has the disease been traced in Westchester County, into the herd of Mr. Prentice at Albany and to different places in New Jersey, where at different times there have been outbreaks of the disease. That it is contagious and not epidemic in character, it is pertinent to observe, that the fact appeared in evidence before the Massachusetts commission that the disease never extended from Mr. Chenery's herd to an animal in the town in which he lives, but to other towns where he had sent his animals the disease was carried; and that wherever he had sent an animal to come in contact with other animals, there the disease was carried. You may isolate contagion, but no man can so effectually bar his door to shut in an epidemic disease that it will not find its way to his neighbor's dwelling. Your commission cannot be expected to enumerate all the facts that have come to their knowledge and led them to believe the disease eminently contagious; but cannot refrain from stating one, that carried conviction to the minds of the common people where it occurred, of the contagious character of the disease, without asking men of science their opinion. A pair of cattle in North Brookfield, in working condition, from an infected herd, were put into a team of twenty-three yoke and were thus employed a day and a half in moving a building, the cattle composing this large team, belonging to thirteen owners; when the work was done and the team discharged, the disease was carried into thirteen different herds—every animal exposed to the diseased yoke taking the infection and carrying the disease to their respective herds. No satisfactory explanation of the virulence of the contagion in this disease of the horned cattle far exceeding any thing known in the human subject can be offered, unless it be in the fact that the seat of the disease being in the structure of the lungs, every *expiration* of the animal surcharged with the contagious miasma must so load the atmosphere with the infection as to impress every animal that inhales it. We admit this has no parallel in the human subject, neither has the disease in its pathological character. In pneumonias in the human subject the vesicular structure of the lungs is unquestionably the proper seat of the disease, but in horned cattle the interlobular cellular tissue is the part primarily and mainly affected, and the cellular tissue is secondly so, and then only is it observed when the disease in the interlobular tissue is far advanced.

In this opinion of the contagious character of the disease, your commission is assured they are sustained by practical men, men of science and editors of agricultural journals in Europe, where the more extended prevalence of the disease has invited to more thorough investigation than has been enjoyed here.

Should any opinion be asked as to the economy of a course to be pursued on the appearance of the disease, we would advise an immediate separation of the sick animals from the remainder of the herd, rigidly confining them to sheds or pens, removed at a considerable distance from the other animals on the farm, and an isolation of all that may have been exposed to the infection, till the danger has passed. Our only safety at present seems to be in isolating the different members of an infected herd. The vastness of the interests at stake may make it the part of wisdom to secure most certainly, in all cases, the rigid observance of this practice by legislative enactments in this State similar to what has been had in some other States.

The Commissioners are happy to be able to acknowledge the services rendered them by the Massachusetts State Board of Agriculture. Its secretary, Charles L. Flint, Esq., was found ready at all times to afford any assistance and encouragement in his power, and attended personally at many of the post mortem examinations.

At a meeting of the State Board, held on the 15th of May, 1860, it was "Voted: that a committee of three from this board be appointed to advise with the Commissioners for the extirpation of pleuro-pneumonia, and devise with them the most active and efficient mode of carrying out the objects of the commission; and that they make a full report of their doings to this Board." Prof. Clark, of Amherst, Hon. John Brooks, of Princeton, and Rev. C. C. Sewall, of Medfield, were appointed as this committee.

The committee, thus constituted by the State Board, entered upon the duties assigned them with great promptness; and contributed very much to relieve the labors of this commission. Their advice and co-operation, during a most pressing period, were of the highest value to the public; and the Commissioners feel under great obligations to the gentlemen personally, as well as to the Board, which generously empowered them to act. The records of the commission abundantly testify to the extent and efficiency of the services rendered by these delegates of the State Board.

The Commissioners also acknowledge, with great pleasure, the attentions received by them from His Excellency, Governor Banks, His Honor, Lieut. Gov. Trask, and other gentlemen connected with the State government; and they would do injustice to their own feelings, if they did not bear testimony to the uniform courtesy and kindness shown by the various farmers and owners of stock, with whom they have been brought in contact. With scarce an exception, these have manifested a great desire to facilitate the action of this Board, and to afford all needed assistance.

To Mr. Chenery, who has been so peculiarly unfortunate in his connection with this disease, the public are greatly indebted for the careful manner in which he has isolated his herd from the first moment he believed them infected with a contagious disease. His whole course deserves high commendation.

At this point the Commissioners take leave to introduce an extract from "The Veterinarian," published in London, that it may be seen in what manner the malady in question is spoken of, and in what light the proceedings of the government of

Massachusetts in relation to it, are regarded abroad, by those best qualified to judge.

> "We took occasion a short time since to notice that the fatal disease of cattle known as pleuro-pneumonia had made its appearance in Australia and America. The facts connected with its introduction into both these countries so completely proved the contagious nature of the malady, that we did not hesitate to declare our conviction that unless the most prompt means were forthwith adopted to arrest its progress, it would gradually extend itself, and cause a fearful destruction among bovine animals.
>
> The intelligence which we have recently received not only confirms these opinions, but puts us in possession of the measures the respective governments have had recourse to, and which we must designate as *bold and decisive*. If the home government had taken up the subject in the same spirit, on the first appearance of the malady here, doubtless we should not have now to lament the ruinous consequences it has brought on so many individuals, nor the immense losses the whole country has sustained."

In view of the well established contagiousness of pleuro-pneumonia, the Commissioners strongly recommend that measures be taken to call the attention of Congress to the propriety of enacting such quarantine regulations in relation to the admission of foreign cattle, as shall effectually guard the country against the danger of another importation of this contagious and fatal disease. That there is no safety in bringing neat stock from any part of Europe, is very obvious; and since it is not unlikely that the importation of such stock will continue, the regulations proposed seem in the highest degree important. The Commissioners trust the legislature will take such action in the premises as the exigency demands.

They feel that they cannot close this report in a more appropriate manner than by quoting the opinions of Professor Simonds, the distinguished president of the London Veterinary College, respecting the pleuro-pneumonia, lately given at an agricultural meeting in Ipswich, England, as reported in the Mark Lane Express.

Professor Simonds may be properly regarded as the highest European authority on this subject. He has devoted much attention to it, and studied it carefully, both on the continent and in the United Kingdom. He has a knowledge of all that has been done in the past and all that is doing at present; and his opinions seem to be in perfect accordance with the legislation of the Commonwealth. President Simonds said:—

"He considered the term pleuro-pneumonia a misnomer. The name of a disease should always correspond with its nature. Pleuro-pneumonia signifies inflammation of the pleura and the substance of the lungs; the disease itself was really not of an inflammatory character. On the question of its contagiousness, we had but too strong evidence that it *was* contagious, and, unhappily for the country, this fact had too much been lost sight of. In fact this disease was an epizoötic. In August, 1842, just previous to the alteration of the tariff, the disease came to us. It was then new to us, but it was not a new disease in foreign countries. It had raged throughout the continents of Europe, Asia, and Africa; but until the last few years it had not appeared in America or Australia. Recently, it had appeared on those continents also; and its arrival there could be traced to contagion. Many diseases were disseminated both ways. The morbific matter entered the system, and when seated there poisonous exhalations were given off. This was the case in smallpox: after the disease had reached a certain stage, pustules were formed, and each pustule contained the same morbific matter as was originally inhaled. It was not the case that all animals exposed were infected, any more than it was with man. There must be a susceptibility as well as a cause. Some constitutions would resist more than others, just as men were differently affected by strong drink. This opened the way to speak of *secondary causes*, and how farmers might help nature to resist the disease. Animals were rendered susceptible by *over-crowding*. Hence, in the London dairies the disease was more rife than any where else. Damp and wet yards were also to be avoided, and keeping cattle in places where much muck was fermenting, especially if animal matter was present. There were some pastures which in dry weather were unexceptionable; the same pastures in autumn, when exposed to fogs and damp, would engender it. To use plain language, we must have our wits about us.

The malady itself: it was not an inflammatory, but a local and specific one. The morbific matter enters into the blood by respiration, and then concentrates itself in the lungs. This affection was in many respects very peculiar. It is an eminently *fatal* disease. We were often twitted with our inability to stop its ravages, while cases were reported in which some ignorant cow-leech had treated it successfully. In explanation, we might say that it is not every farmer who is able to recognize the presence of the disease in its early stages—indeed, they were not easily distinguished by the regular practitioner. In those cases where these marvellous cures had been effected, the truth was, the disease had not been present at all; but the farmer was not sufficiently acquainted with its early symptoms to be able to detect the deception of the man who said that the affection he had cured was this disease. Bring any of the boasted remedies to a genuine case—one fully established to be such by the testimony of competent persons—and they invariably failed. The lungs were aerifying organs, and both in cattle and in man, nature is unable to remove the deposits caused by the disease, and to substitute sound tissue in the place of that destroyed. *It always was a fatal disease and always would be;* the more we know of it, the more positive we were of this. In no one case has an animal ever been cured; the disease is sometimes arrested, *but never cured.* It often happens that cattle are sold appearing well; when slaughtered, the lung is found diseased. Sometimes, in the centre of an apparently healthy lung, a diseased portion is found which is dead and insulated by nature from the living part, being surrounded by a layer of lymph. In no case was the mischief done by the disease upon the lung ever repaired!

When does its contagion cease? is a question upon which there has been much discussion, and which is still undecided. As soon as the animal sickens, the disease is contagious. If it was arrested, it was not easy to say how soon the animal might safely mix with others. The legislature might, with much benefit to the country, take this matter up. On the continent, the measures taken by governments had done much to stay the ravages of the disease. In some countries, if a herd were affected, it was compulsory to separate it immediately; the proprietor was compensated by the government, whose officers took possession of the herd: those badly diseased were slaughtered, and those that were not affected or had recovered were branded on the horn so as always to be known. By the adoption of such measures as these, much had been done to lessen the severity of this scourge.

The principles of treatment: these could only be properly put into operation by a veterinary surgeon. As a farmer himself, and addressing farmers, he would recommend, when the disease was decided, *to spend nothing in physic. Get rid of the beasts as soon as possible;* the first loss was the best. There were some preventive measures which might be put into operation with advantage. When it entered a herd much might be done to prevent its spread, by remembering the contagiousness of the disease, and that a certain state of the system was necessary before it was taken. Sometimes it was dormant in the system a long time before it broke out. When this was the case the morbific matter might be got rid of. In this respect this disease differed from all others. The first thing to be done was to remove the healthy animals; this was decidedly better than removing the affected, as there might be something in the place where the disease first appeared to induce it. In altering the circumstances we might remove some secondary causes. Next, as to bringing the system into a healthy condition, and, if possible, to rid it of the morbific matter: first, a mild purgative should be employed, to induce action of the bowels; second, some agent to act on the urinary organs. The nitrate of potash (1-4 to 1-2 an ounce daily for two or three days) was as good as any thing for this purpose. Thus the system would be gently cleansed. Third, for the encouragement of the production of pure and healthy blood, some kind of stimulant might be used, as sulphate of iron, or the oil of turpentine. Fourth, feed the animals generously. The early adoption of these means would often rid a herd of the disease.

To sum up, the disease is contagious; it is an epidemic, or epizoötic; it is never cured; it had many secondary causes. Amongst these he would mention the travelling of animals. He would recommend when fresh beasts were brought, that they should be kept entirely away from other stock for three weeks, by which time the disease would manifest itself. If it broke out let it be remembered that it was a *fatal* disease."

Respectfully submitted.

PAOLI LATHROP,
AMASA WALKER,
CYRUS KNOX,
GEORGE B. LORING,
ELBRIDGE G. MORTON,
Commissioners.

OFFICE OF THE STATE BOARD OF AGRICULTURE,
BOSTON, January 8, 1860.

The Board of Medical Examiners appointed in accordance with the law to examine into the disease, presented the following

REPORT.

To the Senate and House of Representatives of the Commonwealth of Massachusetts:

In the summer and autumn of 1859, there appeared among the cattle at Belmont, North Brookfield and vicinity, a disease so fatal that from thirty to forty per cent. of those attacked died. It continued unchecked through the winter and spring, until, fears having been excited that it was of a contagious nature, legislative aid was asked for. A law was promptly passed and approved by his excellency the governor, on April 4th, 1860. This law gave no power but "extirpation." The Commissioners, without any direct authority, very properly called to their aid several physicians and veterinary surgeons, under whose direction many cattle attacked by or exposed to the disease were slaughtered. Finding, however, that the appropriated funds were insufficient, and that the law did not meet all the requirements of the case, the governor was petitioned to call an extra session of the legislature. This being done, the first meeting was held on the 30th of May, 1860.

On this day the Massachusetts Medical Society was holding its annual session in Boston. Its members chose a committee to confer with that of the legislature, and request that a board of scientific men might be appointed to inquire into the disease. A law was passed and approved on June 12th, authorizing the governor to appoint, by and with the advice and consent of the council, "three competent persons to be a board of examiners, to examine into the disease called pleuro-pneumonia." The appointments were soon made, but, some delay arising from the refusal of one gentleman to serve, the board was not filled till about the first of September. Entering at that time upon our duties, we ascertained that the Commissioners had slaughtered 842 head of cattle, and had estimated that there remained, exclusive of Mr. Chenery's herd, diseased, exposed, and suspected, 1,055 animals. The senior member of the board of examiners had requested that no animal should be slaughtered until the board was full, and not then, unless at least one of its members was present. The request was complied with, except in one instance, when the gentleman who engaged to be present was unavoidably detained.

The most logical course to pursue in an inquiry like this, is to ascertain in the first place whether there exists or has existed, on the other side of the water, such a disease as contagious pleuro-pneumonia, and, if this prove to be true, to show, by an analysis of facts, whether we have had the same here.

We do not think it necessary to reprint all that has been written on this subject abroad, but to give, in as concise a manner as possible, a sketch which may serve as a point of comparison and enable others to judge whether our conclusions be just.

In 1844, Delafond published a work upon "contagious peripneumonia." In this he traces the history of the disease from quite a remote period down to his own time, and arrives at the following conclusions: —

1. That from 1693 until 1765, or during a period of seventy-two years, epizoötic diseases of the chest prevailed among the cattle of Germany and Switzerland; but that the descriptions of these diseases kept by Valentin, Kausch, and Bucard Mauchard appear to belong to those of a putrid character, complicated with dysentery and peripneumonia.

2. That from 1765 to 1792, or during a period of twenty-seven years, peripneumonia appeared to prevail only among the cattle of mountainous countries, such as the Vosges, Switzerland, the Jura, the Dauphiné, the Alps, upper Silesia, Piedmont, etc., without invading the level or highly cultivated countries, except Champagne, Bourbonnais and the stables of Paris and its Faubourgs, but in the latter places it reigned but temporarily.

3. That at this time, (1765) Bourgelat first gave a good description of peripneumonia as it appeared among the cattle of Champagne.

4. That from 1792 to 1820, a period during which Europe was the theatre of bloody wars, which desolated and impoverished it, epizoötic pleuro-pneumonia prevailed temporarily.

5. That from 1820 to 1827 there was a recrudescence of peripneumonia among the animals of the mountainous parts of Europe, and that then it seems to have invaded the highly cultivated regions and rich valleys of Italy, Germany, Prussia and France.

6. That it appears to have been introduced into Holland in 1833, into Belgium in 1837, and into England in 1842, by animals which had contracted the disease.

7. That it prevails in many parts of the north-east and centre of France, particularly in those near the capital, which are highly cultivated, and in which constant changes are taking place among cattle.

8. That, on the contrary, the disease has never existed in localities where no foreign cattle have been introduced.

9. That pleuro-pneumonia is, after contagious typhus, the most destructive disease which can attack cattle.

10. That it may arise spontaneously from the influence of local causes and spread by contagion.

We have stated that the disease was first noticed in Holland in 1833. It made its appearance there after an inquest by an agricultural committee upon some infected animals from Prussia. Its ravages afterwards were such that the government felt obliged to prohibit the exportation of cattle. Toward the close of 1835, and at the commencement of 1836, it reached the southern part of Holland, where it spread rapidly, and in the following year carried off seven thousand head of cattle. According to the official reports, Holland has lost from 1837 to 1839, 28,489 animals by pleuro-pneumonia. To-day the fine cattle of this rich kingdom are decimated by this formidable disease.

It is evident, therefore, that a disease most destructive to cattle has extended from one part of Europe to another. That the disease is contagious seems also probable, but as this is a most important point, we give the result of Delafond's researches upon it.

1. The malady, while in a herd of cattle, presents all the general characters of contagious affections.

2. Fifty-two distinct observations show that 387 healthy animals, exposed in stables to those diseased, contracted pleuro-pneumonia, and that among this number were thirteen animals from districts where the disease did not exist.

3. Nine observations prove that 54 healthy animals contracted peripneumonia after being introduced into pastures with diseased or suspected cattle, and that among these 54 were five brought in a healthy condition from distant places.

4. Ten observations seem to prove that 64 animals had peripneumonia, after exposure to the emanations from the remains of bodies of dead cattle, and that of this number, two contracted it by the inoculation of morbid materials from the diseased lungs.

5. The number of well authenticated examples of contagion amounts to 505.

6. Two observations render it very probable that animals convalescing from pleuro-pneumonia are still able to transmit the disease.

7. It is not certain that those who take care of affected animals can communicate the disease to those which are healthy.

8. The purchase of affected animals, at fairs, markets or elsewhere, in localities where the disease prevails, is a great cause of its dissemination.

9. Twenty-six veterinary surgeons of high standing in France, Germany, Italy, Switzerland, Belgium and Holland, have published their opinion, in favor of the contagiousness of the disease; and in the veterinary congress held at Hanover in 1841, all the members, twenty-three in number, declared their belief in the same.

10. The time of incubation is from twenty-four to twenty-five days, but, as it is difficult to settle precisely the moment of contagion, we must admit that the time is from thirty to forty days, more often within, very rarely beyond this.

11. The nature of the virus, like that of all contagious diseases, is still unknown. Its seat appears to be the affected lung. The expired air, the nasal mucus, the saliva, the emanations from the affected organs are the ordinary vehicles. Finally, the contagious atmosphere around the animals is limited, and cannot be carried far by currents of air.

Admitting then that such a disease as contagious pleuro-pneumonia exists, let us endeavor to ascertain whether there are any symptoms by which it may be recognized.

Dr. J. M. Kreutzer, in a valuable work upon this subject, published at Erlangen in 1854, gives the following:—

The most unmistakable signs of pulmonary disease are derived from auscultation and percussion, but it is impossible by these means to discover the nature of the lesion; we cannot distinguish it from simple inflammation of the lungs.

Among the external signs, we have almost always a peculiar short cough, particularly in the morning, or when the animal rises or is allowed to drink. The appetite is variable or slight, the secretion of milk diminished. At a later period there is unusual dilatation and contraction of the alæ nasi, and a more or less rapid, short and unequal respiration. The peculiar cough becomes more dry and painful, and, in the very worst cases may be entirely absent. In young, powerful animals, the mucous membrane of the nose is, at the commencement, red and dry, but, at a later period the color changes to a yellowish-white. Still later, there flows from the nose either a clear and thin, or a viscid and variously colored fluid. This may come from the nose itself or the bronchi. In the latter it is often found in masses as thick as the finger, and great relief is afforded by the expulsion of one of these. Pain is caused by pressure upon the chest, behind the shoulders, or upon the lumbar region, and animals show this by shrinking.

The local signs often exist in a slight degree for weeks or months without any constitutional symptoms. In the febrile stage at the commencement of the disease, in strong animals, the pulse is full and hard, but in those which are weak and badly nourished, it is soft and full. Finally, it becomes in all soft and rapid. At the commencement of the febrile period, the animals stand with the back curved upward, and the head and neck outstretched. In the pasture they separate themselves from the herd. As the disease progresses, they almost always stand with the anterior part of the body immovable. They rarely lie down, and then only for a short time, either upon the affected side or on the breast bone, with the fore feet beneath them or stretched out in front. Towards the close, when suffocation is imminent, they lie with the head and neck outstretched and the mouth open. The hair upon the chest and neck loses its lustre and stands up. The skin is dry, and is more firmly attached to the withers and walls of the chest than to other parts. Appetite and rumination cease entirely in the febrile stage. Water excites cough, and is taken with difficulty. From the dry mouth, there flows more or less viscid, dirty, offensive fluid, or a frothy saliva. The milk is either secreted in small quantity and is deficient in fat; or ceases altogether. The urine is dark brown, has a strong odor, and is passed with difficulty. The fecal matter at the commencement of the disease is less abundant, firm and dark brown. At a more advanced period, there is either constipation, or the fæces becomes hard and black, or green, watery and offensive. Abortion frequently takes place, either immediately before the appearance of the disease, or at the commencement and in the course of the same.

The duration of the disease depends upon the length of the chronic or non-febrile stage. If the latter be long, the disease may last several weeks or months. If, on the contrary, fever makes its appearance early or at the commencement of the disease, the latter may terminate in from seven to fourteen days, rarely under, more frequently over that time. Death is, unfortunately, the most common termination. A complete recovery may however take place, and the animal afterwards die of the effusion into the pleura and pericardium, or chronic pulmonary œdema. Sometimes, but rarely, complete recovery takes place; but this is only possible when the disease is checked at the commencement, or at an early period.

MORBID ANATOMY.

The same author states that the morbid appearances vary according to the period at which the animal dies or is killed.

At the commencement, no exudation is found, but isolated portions of the interlobular cellular tissue are in a hyperœmic condition, somewhat swollen and opaque. If the process has advanced a little farther, we find in the same interlobular tissue a thin layer of amorphous material, and, not infrequently, small ecchymoses. The pulmonary tissue is œdematous, and contains less air than usual. These appearances at the commencement are usually noticed in the interior of the lung, without disease of the pleura. If, however, superficial portions of tissue are effected, the pleura participates, becomes opaque, and, still later, is covered with an exudation which is also found beneath it. In *very rare cases*, this change takes place not only in the interlobular tissue, or in this and the pleura, but also in the pulmonary tissue itself, i. e., the vesicular structure, which, as we have seen, is ordinarily the seat of œdema only. In many cases, large portions of the cellular tissue are attacked, and sometimes the process commences upon the surface and in the deeper seated parts of the lung at the same time. The disease either commences in one lung and is limited to it, or extends to the other, or invades both lungs at the same time, which is, however, more rare. At a still later period the cut surface presents a marbled appearance, and the pleura is covered with a layer of false membrane, the thickness of which varies in different cases. In the pleural cavity or in the interstices of the fibrinous exudation is found more or less serum.

Still later, the lungs are found enlarged, and their weight much increased. They are firm, compact, liver-like, and there is an absence of crepitation. The surface is not uniform, but divided into irregular portions by numerous broad, yellowish-white lines. The cut surface presents the same marbled appearance as before, caused by the change in the interlobular tissue, which is sometimes from one to two lines thick. With these, the red intervening tissue contrasts strongly. From the surface there flows a red serum. The smaller bronchia, on close examination, do not present a trace of exudation, and, in the larger, the mucous membrane is perfectly normal. As the proper pulmonary tissue is only infiltrated with serum, we may force the latter out, and then inflate the lung. Sometimes there are ecchymoses or larger effusions of blood, but rarely hepatization of the substance of the lung, this being exceptional.

The new material found in the interlobular tissue varies in different parts. Where it is in contact with the lobules it resembles cellular tissue in process of formation. It cannot be distinguished from that which forms in other inflammatory conditions, in the neighborhood of organized parts. The portion of new material farthest removed from the living tissue is frequently not organized, and may form a caseous friable layer, composed perhaps of distinct laminæ. Under the microscope it presents nothing characteristic.

In many cases irregular portions of lung of various sizes are partially or entirely separated, and afterwards become enclosed in a sac several lines in thickness, composed of newly-formed cellular tissue. This change simulates what we find in tubercular disease, but in the latter the encysted masses are much smaller. The small masses, however, in both cases, may after a time become calcarious, and thus be mistaken for each other. The mass mentioned is not always completely detached, but is sometimes retained in the cavity by a portion which still maintains an organic connection with the surrounding parts. The masses, when removed, generally appear as if just separated, and have undergone no gangrenous change. The interlobular material and the pulmonary tissue may be easily distinguished on the cut surface. The mass, however, in some very severe cases does become gangrenous.

After the disease has reached an advanced stage, incomplete restoration may take place, but large detached masses are not absorbed as is shown by the examination of animals in which they have been found as large as one, two, or three fists, a year after recovery. In the other organs we usually find no changes, and if any exist they are not essential.

Having thus shown that there has prevailed for a long time among the cattle of Great Britain and Europe a disease, which is in all probability contagious, and having described its most marked peculiarities, let us examine the facts belonging to the disease which made its appearance in our community during the past year. The medical board was appointed at a time when the disease no longer existed in an active state, and after most of the affected animals had been destroyed. On this account it was useless to attempt any experiments; and to obtain any knowledge of the disease, it was necessary to rely upon the records of the Commissioners, which are unfortunately of such a character that portions only could be used, as we felt compelled to reject every doubtful statement. We do not intend to deny that the animals reported as diseased were so, but the terms used are not such as to convey an accurate idea to a medical man.

HISTORY AND PATHOLOGY.

No better history can be given of the origin of the disease in this country than by inserting a copy of a letter from Mr. Chenery, published in the Boston Cultivator on March 7th.

BOSTON, March 7, 1860.

DEAR SIR,—In compliance with your request, I take pleasure in furnishing you with a succinct account of my last importation of cattle from Holland, and, also, of the disease that subsequently prevailed in my herd at the Highland Farm in Belmont, as is now generally supposed, in consequence of that importation.

It may be remarked, that I had previously made two importations of cattle from Holland, and the extraordinary superiority of the animals received from that source, in comparison, either with our native, or any of the foreign breeds heretofore imported, induced me to increase my stock of Dutch cattle by further importations, rather than wait the natural increase from those already imported.

Accordingly, in December, 1858, I transmitted an order to my correspondents in Schiedam, Holland, instructing them to employ a competent person expressly to proceed to the north of Holland and make selections of the best animals that could be obtained without regard to the expense. Following my instructions, four cows were procured from

Purmerend and the Beemster, and were duly shipped at Rotterdam, on board the barque "J. C. Humphreys," which vessel sailed from that port early in April, and arrived here on the 23d of May, 1859.

Upon examination, the cows were found to be in an extremely bad condition,—very much bruised and emaciated,—one of them, as the mate of the barque stated, not having been on her feet during the twenty days preceding her arrival; another one was totally unable to walk, and these two animals were accordingly carried to the farm in wagons—the remaining two were driven out.

Deeming it impossible for the first mentioned cow to recover, she was on the 31st of May slaughtered, and on the 2d of June following, the second cow died. At that time, in common with every one knowing the fact in the case, I was so fully persuaded that the bad condition of these animals was caused by neglect on the voyage, that I libelled the vessel and went through a course of $150 worth of law in my endeavors to obtain indemnity for the loss, but the law is uncertain, and the barque went on her way. My mind, however, remains unchanged with regard to the treatment the animals received on the voyage.

The third cow of this importation seemed to be doing well until about the 20th of June, when she became sick and died in ten days after. The fourth cow, Lady Beemster, has down to this time shown no indications of sickness, but is, on the contrary, in a thriving condition.

Early in the month of August following, symptoms of disease were observable in the Dutch cow, Lady Louise, (imported in 1852.) She died on the 20th of the same month. About this time several other animals were taken sick in rapid succession, and then it was that the idea was first advanced that the disease was identical with that known in Europe as "epizoötic pleuro-pneumonia." From that date every possible precaution was taken to prevent the spread of the supposed distemper, strict orders having been given that no animals should be allowed to leave the farm, nor any strange cattle to come upon the premises. A temporary building was erected in a pasture at considerable distance from the farm-barn, to which the animals not infected were removed and disinfecting agents were used about the premises, &c.

The following extract from my letter book, in answer to an application for stock during the prevalence of the disease, will serve to show my views with regard to it at that time: "I am, at present, obliged to decline any applications for stock, owing to an epidemic disease in my herd. The disease is that known as 'pleuro-pneumonia,' and I have already lost seventeen head, and have ten more very sick. I am using every precaution to prevent the disease from spreading, and you will of course see the propriety of my refusing to allow any animal to leave the farm until the infection has ceased."

It is manifest that the means used to prevent the spread of the distemper have so far proved eminently successful, inasmuch as, notwithstanding I have lost some thirty animals—nearly half of my whole herd—there has not been a single case of the disease elsewhere in the neighborhood of my farm.

As there seems to be an impression abroad that the disease in my case was confined exclusively to the Dutch stock, I would remark that such is not the fact; that on the contrary, they have, comparatively, been more exempt from it than any other breed. It is not, however, confined to any particular breed, or to any age or sex, as the full-grown ox, the mature cow, and the young calf have been alike prostrated by it; and of the animals lost, five were thorough-bred Dutch, five Durham, one Ayrshire, one Guernsey, two Jerseys, five Devons, two Natives, (all the Natives on the farm,) and the remainder were grade Dutch.

There has been no new case of sickness in my herd since the death of the mammoth cow, Lady Washington, which occurred on the 8th of January, and I am therefore induced to believe, that, so far as my animals are concerned, the disease has run its course.

From the foregoing remarks, it will be perceived that some months ago, when the disease was raging, I believed it to be infectious or contagious, but I confess that more recently the conviction has forced itself upon me that it was of an entirely local character; that the lungs of the cattle had become diseased by breathing carbonic acid gas, generated in the cow house in consequence of insufficient ventilation. The recent developments with regard to the spread of the disease in North Brookfield and vicinity—in tracing its origin to the calves that went from my farm in June last—together with the information that I have just received in a letter from Holland, upon the subject, (published in the "Cultivator" of last week,) will, I fear, force me back again to the belief that it is the veritable European scourge.

With regard to the treatment of the disease, I can only say that several of our most eminent veterinary surgeons have availed themselves of the opportunity to study the disease by post mortem examinations and otherwise, and are, doubtless, competent to give valuable information upon the subject. My own private opinion, based upon costly experience, is, that whenever an animal becomes *really sick* with this distemper, the best treatment is to slaughter and bury forthwith. In Holland, the practice of inoculation as a preventive—as explained in the letter referred to above, and which has been given to the public—has been productive of extremely gratifying results, for "where the peasants formerly lost from fifty to sixty per cent. of their cattle, they now lose only one per cent."

In concluding this long letter, I beg to say that if it shall prove that, through my efforts to improve the breeds of neat cattle, I have been the means of introducing this disease into the country, I am sure no one can possibly regret it more sincerely than myself. At the same time, I find some consolation in believing that,—provided the disease can be restricted to any thing like its present limits,—the benefits conferred by the introduction of the Dutch cattle here will more than outweigh the losses incurred by the introduction of the disease. Respectfully,

WINTHROP W. CHENERY.

Let us now trace the further extension of the disease.

Curtis Stoddard, a young farmer of North Brookfield, bought of W. W. Chenery, of Belmont, in June, 1859, three young cattle, one bull, and two heifers, from six to eighteen months old.

These he took by railroad to East Brookfield, and then drove them, on the 29th of June, to his farm in North Brookfield, six miles from the depot. One calf showed signs of sickness on the way from the depot.

The Chenery Calves.

Leonard Stoddard of North Brookfield, father of Curtis Stoddard, thinking he could better treat this sick calf than his son, took it to his own barn, where it mingled freely, four or five days, with the other cattle. It was then returned to Curtis Stoddard's barn, where it remained till it died, in a pen next to a passage way through which Curtis's cows passed to be milked, night and morning. This calf was not examined. The two other Chenery calves, after Curtis Stoddard's auction, went to Roland F. Doane's, and were there killed by the Commissioners and examined. These two calves never showed before death any particular symptoms of disease. Their histories will be given in the proper place. We will now trace the disease in the herd exposed to the first calf.

Leonard Stoddard's Herd.

This herd was well until after coming in contact with the sick Chenery calf. Two weeks after the death of the animal, a cow belonging to Leonard Stoddard's herd sickened, and in a few weeks died. There is no record of a post mortem. This herd consisted of forty-eight head, exclusive of calves, the latter being in all our calculations excluded. One animal after another was attacked till the 12th of April, when thirteen head had died, and most of those remaining were showing symptoms of disease. They were afterwards killed by order of the Commissioners, and a few examined with the following results:—

Autopsy 1.—This cow appeared badly. She coughed, but it was said, ate well. The posterior lobe of the lung adhered to the diaphragm, was indurated, and contained a cyst in which was a very small quantity of pus, and a mass of detached lung of the size of a quart measure. This was connected with the main portion of the lung by bronchi, some of which had been cut off in such a manner as to admit air into the cyst. The mass was offensive, friable, and on incision did not present the bright, mottled, organized appearance of similar masses lying in air-tight cysts. There was no serum in the chest.—Dr. MARTIN, April 12, 1860.

Autopsy 2.—An ox 7 years old. The lung was extensively and firmly adherent in various parts, and almost "as hard as a stone." On incision there was found a large cyst containing pus and lymph.—Drs. DADD and THAYER, April 19, 1860.

Autopsy 3. A steer 3 years old. The owner said that this animal was but slightly, if at all sick. The left lung was adherent to the pleura costalis, and diaphragm. On incision there was found in the middle a large cyst containing pulmonary tissue. The right lung was adherent, but its substance healthy.—Drs. DADD and THAYER, April 19, 1860.

Autopsy 4.—A steer 2 years old. Marked adhesion of the posterior superior portion of the lung to the diaphragm. Some consolidation of the lung. The right lung contained a cyst in which was a mass not entirely separated.—Drs. DADD and THAYER, April 19, 1860.

Autopsy 5.—A cow 8 years old. The owner said that this animal was one of the most healthy in his herd. At the apex of the left lung was a very large slough. There was also red hepatization.—Drs. DADD and THAYER, April 19, 1860.

Autopsy 6.—An ox 7 years old, owned by Curtis Stoddard, and exposed to the Chenery calf during the illness of the latter. The superior anterior portion of the right lung was much enlarged, and contained a large cyst, in which was a quantity of pus and a mass of detached pulmonary tissue. Left lung adherent to the diaphragm.—Drs. DADD and TYLER, April 20, 1860.

Autopsy 7.—The anterior lobe of the right lung adhered to the sternum. A portion of the pulmonary tissue was separated and contained in a cyst.—Drs. BATES, DADD and THAYER, April 21, 1860.

Autopsy 8.—A yearling heifer. Much serum was found in the chest, and the pleural surfaces were extensively adherent. The substance of the right lung was completely marbled, some parts having suppurated while others were only indurated.—Dr. TYLER, April 27, 1860.

Other examinations are reported in connection with the herd, but in such language that no definite conclusion can be drawn from them.

Alden Olmstead's Herd.

Monday, November 28, 1859, Leonard Stoddard sold a pair of oxen from his diseased herd to Alden Olmstead, of the same town. Mr. Olmstead kept the oxen till the next Saturday, and then exchanged them for another yoke belonging to William F. Doane, who kept them until they were killed on May 9th, 1860. This yoke of oxen showed at their examination after death unequivocal marks of disease of a character similar to that previously described.

In two weeks after these oxen left Mr. Olmstead's herd, one of his (Olmstead's) animals, was attacked with coughing, shivering, grunting, and rapid respiration. In two or three weeks it died, but there was no post mortem examination. One animal after another was taken sick, so that on the 12th of April seven out of twenty-three had died, or were so near death, that, to prevent hopeless suffering, they were slaughtered. Many of the remaining animals were in a bad condition, and the entire herd was finally slaughtered by the Commissioners. Several examinations were made.

Autopsy 9.—Killed a cow which had been sick nineteen days. She was feeble, had but little appetite, diarrhœa, cough, and shortness of breath. Hair rough, &c. Percussion dull over all the left side of chest, with absence of respiration. The left pleural cavity contained several gallons of serum, by estimate. Over the costal pleura was a firm layer of lymph resembling the velvety parts of tripe. The whole lung was indurated, especially at its base, and brittle, like liver. No pus. Right side and lung healthy.—Dr. MARTIN, April 11, 1860.

Autopsy 10.—Killed a cow 10 years old. Sick since January. Dulness over the left side. On opening it there was a gush of fœtid matter as thick as tar. Strong adhesions to the ribs. In this lung was a large tumor enveloped in a cyst or sac. Right lung indurated.—Drs. DADD, THAYER and TYLER, April 19, 1860.

Autopsy 11.—Killed a calf 3 weeks old. In the right pleural cavity was a quart of serum. Lymph, easily separated, was spread over the surface of the lung. The left lung adhered to the ribs, sternum, and pericardium.—Drs. DADD, THAYER and TYLER, April 19, 1860.

Autopsy 12.—Killed a cow 10 years old, which had been sick three or four months. The posterior superior portions of the right lung adhered so strongly to the ribs and diaphragm, that the knife was necessary for their separation. On opening the posterior part of the lung a detached mass was found, very soft, surrounded by pus and contained in a sac. Left lung healthy.—Drs. BATES, DADD and THAYER, April 21, 1860.

Autopsy 13.—Left lung healthy, but slight adhesions to diaphragm. Right lung firmly adherent to the diaphragm. In it was found a mass of consolidated lung not entirely separated.—Drs. BATES, DADD and THAYER, April, 21, 1860.

Autopsy 14.—Killed a calf 4 weeks old. Right lung inflamed. Left chest filled with serum. Lung covered with lymph. Drs. BATES, DADD and THAYER, April 21, 1860.

Autopsy 15.—Killed a cow 9 years old, and mother of the calf. In the right lung was a cyst of the size of a pullet's egg, filled with pus. The left lung contained a small cyst filled with the same. Heart flabby —Drs. BATES, DADD and THAYER, April 21, 1860.

Autopsy 16.—Killed a stag that was in the "big team." Three months before, he had been sick for four weeks, but had recovered, and had been working very hard. Serum in the right pleural cavity. Lung indurated, and adherent throughout so strongly to the ribs and diaphragm, that it was necessary to cut or scrape it off. In this lung was a small cyst.—Examined May 9, 1860.

Autopsy 17.—Killed the other stag. Left lung useless. Serum in the chest. Right lung in the acute inflammatory stage.

These stags were taken December 3d, 1860, in exchange for a yoke of oxen sold at the same time to William F. Doane, and kept with Olmstead's diseased herd. They were in the "big team" December 19th. —Examined May 9, 1860.

Alanson A. Needham's Herd, New Braintree.

January 3d, 1860, Mr. Needham took three animals from Stoddard's diseased herd into his, which was at that time well. One of these animals was sick when purchased, so that he kept her but three weeks, and then drove her back to Stoddard's, where she died. There was no post mortem. The two steers never appeared sick. On the 30th of January, twenty-seven days after the introduction of these cattle, a cow of his original herd was taken sick; then one after another drooped till most of his herd were attacked, and eight out of twenty-two died before April 11th. Those which did not die from the disease were killed by the Commissioners, and may of them examined.

Autopsy 18.—Killed a cow which was taken sick on January 30th, 1860. In fourteen days she began to get better. When killed she was gaining flesh, breathed well, and the hair was healthy. She gave ten quarts of milk a day, and in all other respects was healthy, with the exception that she had a slight cough. Percussion dull over the base of the left lung, near the spine, and respiration feeble in the same region. Left lung strongly adherent to the ribs and diaphragm. The long adhesions were smooth, and the pleura, where free from these, was healthy. The lung was of a light pink color, and permeable to air, except at the base, in which was a cyst containing a pint or two of pus. Floating loose in this pus, was a hard mass as large as a two quart measure. This on incision was found marbled in the centre, and presented the appearance of indurated lung detached by suppuration. The cyst seemed to be air tight, the bronchi being plugged with lymph.—Dr. MARTIN, April 11, 1860.

Autopsy 19.—Killed a cow which had been sick fourteen days and was so sick as to be scarcely able to walk. She was coughing and breathing badly. Hair rough. Percussion dull over both sides and respiration very feeble. Both pleural cavities were filled with serum, and there was a deposit of lymph upon the costal pleura an inch thick. The right lung was indurated at its base, and the left throughout its whole extent. These diseased portions were brittle, like the liver. Firm adhesion to the diaphragm and ribs near the spine, the lungs being forced back from the parietes elsewhere by the accumulated serum. Nearly one-third of the right lung was compressed by the serum.—Dr. MARTIN, April 11, 1860.

Autopsy 20.—Killed a heifer belonging to Charles Wilcox, a neighbor of Mr. Needham. She was kept with Mr. Needham's herd because, as she coughed, it was feared she might have contracted the disease from these infected animals. She was in fair condition and ate well. There was dulness on percussion, over the base of the left lung, which part adhered to the ribs and diaphragm, and was indurated. On cutting into this diseased lung there were found ulceration, and a head of Timothy grass, four or five inches long. This animal was in every other respect well.—Dr. MARTIN, April 11, 1860.

Autopsy 21.—Killed an animal which had been sick four weeks. Right lung indurated at the base and adherent to the diaphragm and costal pleura; in it was a cyst containing a little pus, and a mass of pulmonary tissue, separated on one side only.—Dr. MARTIN, April 18, 1860.

C. P. Huntington's Herd, North Brookfield.

On the 15th or 16th of October, 1859, Mr. Huntington bought a cow of Leonard Stoddard. This cow was taken sick on November 1st, and died on December 5th. No post mortem. December 15th, an animal in Mr. Huntington's herd was taken sick, then one animal after another showed symptoms of severe disease, till scarcely one appeared well. Before the 12th of April, eight out of twenty-two had died. No post mortem.

The remaining animals were killed by the Commissioners, and many were examined post mortem.

Autopsy 22.—A cow was attacked on January 1st with a cough, difficulty of breathing and other symptoms of disease, and continued sick till March 1st. On taking her out April 12th, to be slaughtered, she capered, stuck up her tail, snuffed and snorted, showing all the signs of feeling well and vigorous. Right lung firmly adherent to the diaphragm and costal pleura near the spine. No serum. The posterior part of the lung was indurated and contained a cyst, in which was a mass of the size of a two quart measure, floating in pus. The outer portion of this was of a yellowish-white color, irregular, brittle and caseous. The interior was mottled, or divided into irregular squares, red, and was crushed by pressure like the hepatic substance. The remainder of the lung was apparently healthy, except for a short distance about the air-tight cyst, where it was indurated.—Dr. MARTIN. April 12, 1860.

Autopsy 23.—The animal was attacked on December 15th, and was very sick. In three weeks she appeared well, but still had quite a severe cough, which continued till about the 1st of March when it became worse and so continued till April 5th, when she calved, after which she improved and appeared as if about to recover, but was killed on the 12th. On examination, the right lung was found adherent to the diaphragm and costal pleura. At the posterior part was a flaccid fluctuating cyst; on opening this, an offensive, decomposing mass of pulmonary tissue was found; otherwise nothing abnormal.—Dr. MARTIN, April 12, 1860.

Autopsy 24.—Killed a heifer, which had coughed slightly for six weeks, but the owner said that he thought no one going into his herd would notice her illness. There were slight adhesions of the lungs to the diaphragm. Near these were small cysts of the size of a walnut, containing pus and caseous matter. The pulmonary tissue was indurated to the depth of about half an inch around the cysts; it appeared as if the inflammation had attacked isolated lobules of the lung, leaving the intervening portions intact.—Dr. MARTIN, April 12, 1860.

A yoke of oxen belonging to William Fullam were bought from C. P. Huntington's herd, and travelled over the county "teaming" extensively during the winter and spring of 1860. They were killed. One was examined by Dr. Dadd on May 14th. He reported the "right lung hepatized, adherent to the diaphragm, and serum in the chest." "A portion of detached lung in a cyst in the left chest."

Alden B. Woodis' Herd, New Braintree.

About the 12th of December, Leonard Stoddard began to feed his oxen at Mr. Woodis' barn. Stoddard was drawing lumber to a steam saw-mill near Woodis' farm, and was also drawing wood from New Braintree to the village of North Brookfield.

About the middle of January, one of these oxen was taken sick. Three weeks after these Stoddard oxen showed signs of disease, the first cow in Woodis' herd was taken sick; then one animal after another was attacked till April 12th. Previous to this date, four animals had been killed, as having no chance for recovery; this was equal to four deaths out of a herd of twenty-one animals. There were no examinations. The oxen supposed to have given the disease to this herd, were examined at the slaughter of Leonard Stoddard's herd, and found badly diseased. The remaining animals were killed by order of the Commissioners and several were examined post mortem.

Autopsy 25.—Killed a cow, which had been sick three weeks. A large quantity of serum in the left pleural cavity. A layer of false membrane an inch in thickness covered the costal pleural. Lung adherent and indurated at the posterior part. On cutting into the latter portion, a cyst was found, containing a mass, one side of which was separated from the lung and surrounded by pus. The right pleural cavity contained a small quantity of serum and in the corresponding lung were several small solidified portions, with some delicate adhesions, but most of the organ was healthy.

Autopsy 26.—Killed a heifer 3 years old, which had been sick ten days. The right pleural cavity contained about ten quarts of serum, and a large quantity of lymph. The left lung was mostly consolidated, and adhered to the costal pleura. A small part of the lower portion of the lung was unaffected.—Drs. THAYER and DADD, April 12, 1860.

Curtis Stoddard, 2d's, Herd.

This herd is the one into which the Chenery calves were introduced on their arrival in North Brookfield. The herd passed and repassed the sick Chenery calf in a pen, beside the passage-way through which the cows went twice a day to be milked. Of the three Chenery calves, one died about the 20th of July, 1859, before any thing was known about the disease in this vicinity, and was consequently not examined post mortem.

Let us now trace the history of the two remaining Chenery calves. As previously stated, they went to Roland F. Doane's, for keeping, immediately after Stoddard's auction, on November 2d, 1859. The bull-calf was at West Brookfield cattle-show in the Autumn of 1859, and stood next to a bull belonging to the hospital at Worcester. These two Chenery calves were afterwards slaughtered by the commission in April or May, with the cattle belonging to Mr. Doane.

Autopsy 27.—The bull-calf, aged eleven months, and which stood at West Brookfield last Autumn, beside the hospital bull from Worcester, and near many other cattle, was killed at Roland F. Doane's barn. Here are the records as taken by the secretary of the Cattle Commissioners. "Right lung; general appearance healthy, but on *close* examination, distinctly marked spots of exudation were discovered in several places; mucus membrane of trachea injected; left lung in a similar condition. The disease was regarded by the surgeons as in the progressive stage."—Drs. DADD and THAYER, April 13, 1860.

The evidence here does not seem conclusive of disease—morbid appearances are not distinctly described. This animal left Mr. Chenery's diseased herd in June, 1859, and was examined in April, 1860. If contagious, it would probably have been in its advanced, not in its early stage—still, this is not quite certain. It might have taken the disease later, from some newly diseased animal in Roland F. Doane's herd.

Autopsy 28.—The Chenery heifer, killed at Roland F. Doane's. The following is the record: "In the posterior lobe of the right lung was a large spot of emphysema, a portion of the lung carnified. Over the whole posterior lobe a mottled appearance, showing traces of chronic disease. The under surface of the lung was very much discolored. Found exudation into the parenchyma and air-cells. The connecting tissue of the lung thickened as in other cases. The left lung in the same general condition."—Drs. TYLER and DADD, May 3, 1860.

This animal may have had the disease, but the description is so vague that it is not quite certain that "carnified" "mottled," "discolored" "exudation into air-cells," do not mean the same thing, viz.: a want of free emptying of the blood vessels, or in common language, settling of the blood in the lungs, which is not a disease. "Emphysema" is no part of pleuro-pneumonia. It exists in many otherwise well lungs. The cellular "tissue" in cattle is much thicker in health than in man.

Of the remainder of Curtis Stoddard's herd, the following disposition was made:—

Seven animals went into his father's herd, three to Osborn Whiting's, one to J. Shay, of North Brookfield, one to Moses Pollard, of New Braintree, one to Benjamin Cummings, of North Brookfield, two to J. W. Tucker, of same place, one to Michael or Dennis Murphy, ditto, and one to Avery Tucker, of North Brookfield, from him to Richards, of West Brookfield, and from him to Bowen, of Sturbridge.

The seven animals first mentioned were slaughtered with the others belonging to Curtis Stoddard's father, no separate record of them being kept. The three which went to Osborn Whiting's were also slaughtered with the rest of his herd, and it is believed that the one animal examined belonged to these three. The following report of the examination is taked from the records:—

Autopsy 29.—"The right lung was found to be very much enlarged." "The left showed many spots of red hepatization both deep seated and superficial." "The chest contained about a half a pint of serum."—Dr. DADD, April 24, 1860.

This description fails to convey to the mind of the Examining Board any definite idea of disease. This cow went from Curtis Stoddard's November 2d, 1859, and had no other known exposure than in his herd.

The one sold to Shay is now alive and considered well.

The one sold to Pollard was killed by the Commissioners in April or May, and pronounced diseased by Dr. Dadd, but no description was given. The herd is well now. . The one sold to Cummings was killed and examined by Dr. Martin, on April 12th, and pronounced free from pleuro-pneumonia.

Of the two animals sold to Tucker, one is alive and considered well, the other was killed and examined by Dr. Dadd, but the following indefinite record is all that can be obtained. (*Autopsy* 30.) " Found in a state of general disease. One lung in the acute, the other in the chronic stage." Of course no conclusion can be drawn from such statements.

The one sold to Murphy was killed on May 10th, and according to Dr. Dadd, (*Autopsy* 31,) "proved to be badly diseased;" with what is not stated.

The one which passed from Tucker through Richards to Bowen, of Sturbridge, was also killed on May 9th, and pronounced (*Autopsy* 32) " diseased," by Dadd, but no description is given.

Silas H. Bigelow's Herd.

Mr. Bigelow's oxen were kept near C. P. Huntington's barn. Huntington's cattle passed Mr. Bigelow's premises, and Mr. Bigelow's oxen passed Leonard Stoddard's diseased oxen in the road.

This herd was killed and one ox and one cow examined post mortem.

The ox, ten years old, had been ill two weeks with " cough, loss of appetite, sore eyes and weakness."

Autopsy 33.—The examination showed the left lung firmly adherent to the costal pleura. It weighed twenty-three pounds and " was a mass of tubercular matter." The right lung adhered to the diaphragm.—Dr. Tyler, April 28.

Autopsy 34.—Cow 11 years old. The right lung adhered to the costal pleura at the sixth rib. The record appears to show that a large portion of the right lung, weighing a pound and a half, was enclosed in a sac, and found on incision to be "marbled."—Drs. Tyler and Dadd, April 30.

Lewis E. Hill's Herd.

This herd came in contact with Leonard Stoddard's over a low, slight fence, during the autumn of 1859, and one of the animals was so sick on April 21st, that it could not be driven a third of a mile to be slaughtered. On this account, another, less reduced, was chosen.

This whole herd was killed and three animals were examined post mortem. Not one died of the disease, but two would probably have done so in a few days, had they not been slaughtered for investigation.

Autopsy 35.—One of the animals killed had been ailing for a week and was very feeble. The following are the results of the examination. Some adhesions of the right lung to the parietes. Several gallons of serum in the chest. In the right lung was a large cyst containing a mass of pulmonary tissue, as in previous cases. A large part of the left lung was solidified.

Two other autopsies are reported, but in so indefinite a manner that the character of the disease is not clear.

D. W. Hooker's Herd.

Part of them were kept at Leonard Stoddard's. All were killed and two examined post mortem, by Drs. Tyler and Dadd, one on April 20th, when no appearances are described. The important points in the other are the following:—

Autopsy 36.—Lymph on the pleural surface of the right lung. In the superior lobe was a cyst containing a mass of pulmonary tissue.

Roland F. Doane's Herd.

This person had the two Chenery calves to keep, and Curtis Stoddard carted hay there with his oxen from his father's herd. Two animals besides the Chenery calves where examined after death.

This herd it is believed was slaughtered, but the records do not say. The two autopsies made by Drs. Dadd and Tyler, reported in connection with these cases, are unintelligible.

James Hunter's Herd, Spencer.

Had a yoke of oxen from the "big team" of E. D. Knight. These oxen were kept several days at Lewis E. Hill's. This herd was slaughtered on May 10. The records are not sufficiently definite to enable us to give a positive opinion, but it is probable that it had the disease. They were in the immediate neighborhood of Leonard Stoddard's and Lewis Hill's.

The "Big Team."

In this team worked forty-eight oxen, and six more were in the immediate vicinity, awaiting orders. These oxen belonged to fifteen different individuals, and went home on December 19th, into fifteen separate herds. They were used to move a building from Oakham to North Brookfield. They were owned as follows, viz. :—

2—William F. Doane. Killed and found diseased, May 1, 1860.
2—Alden Olmstead. " " " " May 9, 1860.
4—John Hill. Two examined by Drs. Martin and Stickney, December 17th, 1860, and found sound.
4—George W. Knight. Killed, and two examined by Drs. Martin, Ellis, and Stickney. Sound.
6—Elijah D. Knight. One killed and examined by Dr. Tyler, who describes no disease.
4—George Harwood. Two killed and examined by Drs. Dadd and Tyler, on May 2d. Evidence of disease not conclusive in these, or in any of Harwood's herd.
4—Jonathan Pellett. Two killed at A. B. Pollard's. No record.
2—Ebenezer Parkman. Two killed with whole herd. No record.
2—Joel M. Kingsbury. Two killed, one examined. No description, May 10th.
4—J. Hubbard Deland. Killed, but no record.
6—William M. Deland. No record made of examination.
4—Charles H. Stoddard. No records of examination.
4—Charles T. Kendrick. One killed and examined by Dr. Dadd, May 3d.
2—Roland F. Doane. Not with the big team, but in the neighborhood. Killed with his herd. No separate record of examination.
4—Leonard Stoddard. Also killed with the herd. No separate record.

54 head.

William F. Doane's Herd.

In this herd was the yoke of oxen traded by Leonard Stoddard to Alden Olmstead, in whose herd they remained five days, when they were transferred to Doane, and sixteen days afterwards worked in, and it was supposed gave the disease to the "big team" on December 19th. They also worked on December 15th with a yoke of oxen belonging to Chenery Bothwell, and at about the same time worked two days with John Hill's oxen.

Autopsy 37.—One of these oxen was killed and examined by Drs. Dadd and Tyler on May 1st. In the right lung, which was extensively adherent to the ribs and diaphragm, was a mass of detached lung contained within a cyst.

Autopsy 38.—The other ox was examined, but by whom is not stated. Adhesions and a cyst containing pulmonary tissue were found here also.

A cow and a calf belonging to this herd were examined, and judging from the record, cannot be considered as diseased.

We see, therefore, that among the oxen in the "big team" that were *not* in herds fatally diseased previous to or after the 19th of December, no well defined case is found in all the records of the Commissioners.

The same is true in regard to Curtis Stoddard's herd, sold at auction November 2d, 1859. There are some suspicious circumstances in regard to this (Curtis Stoddard's) herd, but the records do not show a single well defined case.

One yoke of oxen that worked in the "big team," and was owned at the time by Charles T. Kendrick, was sold to William B. Dwelly, of Oakham. One of these oxen died of rupture of the bladder in April or May last. The other was killed for beef this last autumn, and reported as being well.

We have been thus particular in giving the history of these several herds to show the innumerable changes that are constantly taking place among the cattle of the farmers of this Commonwealth.

A very large number of other herds were reported as diseased by the medical gentlemen in charge. Some were said to be in the "incipient stage," others in the "acute stage," others in the "chronic stage," many "with thickening of the investing membrane," more with "hypertrophy" and "emphysema," and "red hepatization"—but what idea it was intended to convey by these terms it has been impossible for us to form an opinion. But as it was so frequently found, we are forced to conclude that it was something belonging to healthy animals of the bovine race.

Mr. Chenery's Herd.

June 2d, 1860, Dr. Martin examined a one year old black and white Dutch heifer after slaughtering. She was taken quite sick in September, 1859, and continued very sick about six weeks; then she apparently began to recover. When slaughtered her eyes looked bright, her hair was glossy and smooth, and the appetite was good. She had coughed some since the first attack. Percussion dull over the whole of the right side of the chest. On applying the ear, a coarse mucous rattle was heard at the base of the right lung. The left side of the chest was normal, with the exception that the respiration was more distinct than usual.

Autopsy 39.—At the examination there were found universal firm adhesions of the right lung. In the latter was a pouch large enough to hold a quart or two, with a smooth inner surface, resembling mucous membrane; branching off from the pouch were bronchial tubes. The lung was of a light pink color, and floated in water—it felt like leather, and seemed to have been so compressed that its cells only partially admitted the air. The heart was thin and flaccid. Left ventricle thinner than the right.

Autopsy 40.—Killed a cow six years old; she was taken into the herd December 1st, 1859, as step-mother for a calf whose own mother had died. This cow was presenting all the general appearances of health, but had a slight cough. No adhesions; no serum; but at the base of the right lung was a darkish-red portion somewhat more than three inches square, heavy, and firm, like liver. It did not collapse with the rest of the lung, and was friable. On incision, pus was seen to fill the divided bronchi in such a way as to give the cut surface the appearance of being covered with small pustules. The remainder of this and the other lung appeared healthy.—Dr. Martin, June 2.

There have been killed, from time to time, since September 25th, 1860, in Mr. Chenery's herd, twenty-one animals in all, of various ages and conditions. Of these twenty-one animals, nine were found free from any disease whatever. Of the other twelve, many presented more or less extensive old adhesions of the lungs to the ribs and diaphragm. None had serum in the chest. In the lungs were yellow, friable, caseous nodules of various sizes, the smallest being perhaps a line, the largest four or five inches in diameter. The central portions of some of these being soft, were apparently surrounded by thick, whitish membrane; but this, from the irregularity of its inner surface, was probably only a portion of the original mass, which had not been broken down. In some, marked calcareous degeneration had taken place. The bronchial glands in a number of cases were much enlarged and similarly diseased. In one instance like formations existed in the liver; and in another, two cysts were found external to the lung, one about six inches in diameter, the other not more than three. These both contained a yellow fibrinous material and calcareous matter.

On microscopic examination nothing was seen but pulmonary tissue, small irregular granular cupuscles, with granular and fatty matter. None of these were characteristic of any particular disease, and appeared to be the result of some degenerative process.

We have not thought it necessary to give in detail the different examinations, as the appearances were in all the same. No disease was supposed to exist in a majority of the animals slaughtered.

Quite a number of animals were found in this herd with diseased lungs, and a healthy pleura, but not one with disease of the pleura without disease of the lungs. Several of the diseased animals that were killed, it was said, had never appeared ill.

There have been three animals killed at East Lexington showing no disease save a slight adhesion of the pericardium to the heart, no larger than the finger nail, which is of no consequence.

One animal was killed at Princeton belonging to Justin Eames, of Milford. The neighborhood being alarmed, the animal was sacrificed to appease their fright, and found sound.

One cow was killed belonging to John T. Abbott, of Holden, for a like cause, with a like result. More of this Abbott cow hereafter.

Twenty-two animals * have been killed in North Brookfield that had been directly or indirectly exposed to the "big team," as was supposed, and every one carefully examined, without a trace of disease, old or recent, being discovered.

There have been killed since the extra session—

In Mr. Chenery's herd,	21	
Affected with old disease,	12	
Leaving well,	—	9
At Lexington, and found sound,		3
At Princeton, " "		1
At Holden, " "		1
At N. Brookfield, " "		22
At N. Brookfield, ex. by Dr. Tyler, evidence uncertain,		1
Killed, healthy,		37
Killed, diseased,		12
		49

Five of the diseased animals in Mr. Chenery's herd were killed by the particular request and at the expense of the Medical Board. Three more are retained by them for future investigation, and three were slaughtered and examined post mortem, by the Cattle Commissioners, previous to the extra session. No records of post mortem.

The original herd numbered	67
Mr. Chenery now has alive,	13
Killed by Cattle Commissioners before extra session,	3
Killed by Cattle Commissioners since extra session,	16
Killed by Medical Board,	5
Retained by Medical Board for future investigation,	3
Died,	27—67

Of this herd there died diseased,	27
Killed before extra session, and no doubt diseased,	3
Retained for future investigation, probably diseased,	3
Killed, diseased,	12
Killed, well,	9
Owned by Mr. Chenery now,	13—67

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* Thirteen of these were examined and pronounced badly diseased, condemned, prized, and paid for before the extra session, and were retained to see what would be their fate.

Basing our calculations on these tables, presuming that seven out of the thirteen animals, now owned by Mr. Chenery, are diseased, and we have out of the 67 head in this herd, never diseased or entirely recovered, 16; diseased, 51.

Of the following herds known to be diseased, we have :—

Mr. Chenery's herd, ...	67	head—Died,	27
Leonard Stoddard's herd, . . .	48	" "	13
Alden Olmstead's herd, . . .	23	" "	7
C. P. Huntington's herd, . . .	22	" "	8
A. A. Needham's herd, . . .	22	" "	8
Alden B. Woodis's herd, . . .	21	" "	4
	203	head—Died,	57

A trifle short of thirty per cent., and it is to be presumed that as great a per cent. would have died in the others as in Mr. Chenery's herd, had they been left unslaughtered. These herds constitute, it is believed, all, where any deaths have occurred from this disease, except perhaps in one or two isolated cases. There are the herds of Silas H. Bigelow, Lewis E. Hill, and D. W. Hooker, that probably had the disease; but it is not very well described. The herds of James Hunter, Roland F. Doane, James C. Ayres, and B. W. Deane were sufficiently well described to render them strongly suspected. These suspected herds were exposed later in the season than those where animals have died.

CONTAGION.

We shall divide pleuro-pneumonia into three kinds—sporadic, epizoötic, and contagious.

A sporadic disease is one in which the cases are single or scattered. An epizoötic disease is one which seizes upon a great number of animals at the same time, or in the same season, owing to some external influence, which we cannot understand.

A contagious disease is one which may be communicated by one animal to another, and we shall use the term in its broadest sense, without attempting to make any distinction between contagious and infectious.

The Board of Medical Examiners have been unable to find any absolute marks by which the pathological appearances of one kind of pleuro-pneumonia can be distinguished from another.

If there is induration of the lung, effusion of lymph and serum, pus, and a detached portion of the lung enclosed in a cyst passing to the caseous state, it is difficult to see how from this we can tell whether the cause is sporadic, epizoötic, or contagious.

But we can tell whether it belongs to the same species of disease, and should we find the kidneys affected and not the lungs, it would be a fair presumption that the diseases did not belong to the same family, and that probably they were not related.

Then from what data can we judge whether this be a sporadic, epizoötic, or contagious disease? By its history, and then proving by a careful comparison of its pathological appearances, that the different herds were affected by the same disease.

We find that on the first of June, 1859, four sick cows arrived from Rotterdam, where the disease is said to prevail. These were so ill that it was necessary to carry them on trucks to the farm of W. W. Chenery, of Belmont, where they were introduced into his herd of healthy cattle.

Three of these Dutch cows afterwards died. Then the original herd began to show signs of disease, and one animal after another was attacked, and by January, twenty-seven out of sixty-seven had died, leaving a very large proportion of the others diseased.

About the first of July, three half-breed Dutch calves from Mr. Chenery's farm, started for North Brookfield. One of them was introduced, sick, into Leonard Stoddard's barn, and after lingering three or four weeks, it died, having mingled four days freely with Leonard Stoddard's herd, when it was taken back to Curtis Stoddard's. In twenty-eight days after the entrance of this calf into Leonard Stoddard's healthy herd, a cow was attacked, and in a few days died. Other cases followed each other in rapid succession, until thirteen out of forty-eight died previous to April 11th, 1860.

Then Leonard Stoddard sold a pair of oxen to Alden Olmstead on the 28th of November, (these oxen were afterwards killed and found diseased,) and they were kept five days in Mr. Olmstead's herd. Two weeks after these oxen left, one of Olmstead's cows was attacked, and in two or three weeks died. Others followed her until seven out of twenty-two died before April 11, 1860.

A. A. Needham, of New Braintree, took three animals from Stoddard's diseased, into his healthy herd, on January 3d, 1860. The cow from Stoddard's being sick, was returned as unsound, and soon died.

Twenty-seven days after the arrival of this cow in Needham's herd, one animal was taken sick, and soon others, till eight out of twenty-two died, and many more probably would have met with the same fate had not the herd been slaughtered in April, 1860.

C. P. Huntington bought a cow of Stoddard and took her home, where she soon died. Ten days after, another animal was attacked, and before April 11, 1860, eight out of twenty-two died.

Alden B. Woodis kept in his healthy herd a pair of sick oxen belonging to Leonard Stoddard. In three weeks Woodis' cattle began to show signs of disease, and he lost four out of twenty-one head before April 11, 1860. Not a herd escaped where one of Leonard Stoddard's sick cattle was introduced. No fatal case of disease occurred in any herd in this vicinity except in those into which diseased cattle from Leonard Stoddard's herd had been introduced. This certainly seems very strong evidence in favor of contagion, and the exemption of many animals is only analogous to what we see in connection with all acknowledged contagious diseases.

The only case that appears like an exception to every herd having the disease, after receiving a sick animal from Leonard Stoddard, is that of Curtis Stoddard. We have previously stated that the evidence of the communication of the disease to Curtis Stoddard's herd is inconclusive. But it must be remembered that seven head of this herd were placed, on November 2d, 1859, in Leonard Stoddard's herd, with which they were slaughtered in April, 1860. This herd was exposed by constantly passing the sick calf which was in a pen by a passageway through which the cows went to be milked. It was therefore fair to infer, that as exposure of the herds to sick cattle had in every other instance been followed by disease, such would be the case here. The course of the Cattle Commissioners was therefore clear. They struck at every root and branch of this suspected herd, intending to annihilate all its connections, and following it up with perseverance and success till their money and time were exhausted, before the extra session.

Since then, new facts have given to the case a different aspect. We find two of these suspected animals left without any apparent harm. And we also find alive and well a herd of fifty-three head (Moses Pollard's, of New Braintree) in which one of these suspected animals was kept from November to May, when it was killed and "pronounced," but not described as diseased by Dr. Dadd.

One examined by Dr. Martin and found free from disease at Benjamin Cummings' left no known taint in his herd of ten or twelve head, every animal of which is now alive and well. The one sold to Shay is *now* alive and considered well. The one that passed through Tucker and Richards to Bowen and "pronounced" diseased but not described so, is a little more suspicious. The other was kept by Tucker himself in his own herd of fifteen head, which is now apparently well, save such animals as have been killed for beef and reported "all right." The Stoddard animal is now fattening for beef and is soon to be slaughtered for that purpose. Of the three animals that went to Osborn Whiting's, one was "pronounced" but not proved to be diseased. The one that went to Murphy's, Dadd says "proved" to be diseased, but he does not give the proof.

Thus ends, we hope, the disease in this direction. It may be asked, why did not Curtis Stoddard's herd like his father's take the disease from the sick calf? We will not undertake to explain this as such instances may be found in connection with the most undoubted contagious diseases. It is possible that two or three animals did take it, and were among the seven that went into and were slaughtered with Leonard Stoddard's herd.

"*The Big Team.*"

On the 19th of December, 1859, there assembled together forty-eight head of oxen to move a building, and six head more were in the immediate vicinity to be called upon if needed.

In that team were two oxen formerly owned by Leonard Stoddard which had been exposed till November 28th to his diseased herd. These two oxen had entered Olmstead's herd, which they were firmly believed to have contaminated, during a stay of five days before, December 3d. Sixteen days after leaving Olmstead's herd, this yoke of oxen communicated freely with the "big team." They were killed, examined and found badly diseased in April or May.

Two stags taken in exchange for these two oxen on December 3d, were in Olmstead's herd till Dec. 19th, and were worked in the "big team." Many of Olmstead's herd had died; many were slaughtered and examined post mortem and found diseased, among which were these stags.

At the time of the general slaughter there were six herds known to have the disease, consisting of	223 head.
Curtis Stoddard's herd known to have been exposed to a diseased animal,	19 "
The big team known to have been exposed to a pair of diseased oxen,	44 "
This big team had exposed as was supposed, some	380 "
Curtis Stoddard's herd had as was supposed, exposed some	200 "
Making of primary and secondary exposures,	866 "

Saying nothing of the tertiary ones.

These were the facts upon which the Cattle Commissioners, were obliged to act, having no powers but "extirpation."

It matters not what is known now, that is what was known then. They acted accordingly, and caused to be slaughtered forty-four oxen, and fifteen herds, (between 300 and 400 head) of cattle.

The evidence fails to convince us that a single ox took the disease while in the "big team." There is not a single well described case of disease among all those oxen, except such as were, or had been in diseased herds, or had had some other connection with diseased animals than in that "team." The Medical Board have examined four of those animals post mortem, and found them entirely sound, though some of them were "pronounced" diseased while living. Another was killed for beef and reported well. The same Board have examined post mortem, seventeen other animals exposed directly and indirectly to oxen in the "big team," and many had been "pronounced" diseased, but every one was sound. These oxen were exposed on December 19th, 1859, and according to the appearances found in Leonard Stoddard's herd and others, the disease if it existed should have been in the advanced stage, consequently well marked and of course easily described. There was sufficient time also to have communicated the disease to others before the slaughtering. Therefore if there had been any disease, we should have been likely to have found it well described, and there would probably have been many deaths. We can see no good reason why forty-eight head of oxen should have been exposed and many "pronounced" diseased without a single death or evidence of communication to other cattle, when the disease at the same time in the same neighborhood with less exposure was carrying off some twenty-five per cent. by death.

It may very pertinently and properly be asked why, if these Doane oxen gave the disease to Olmstead's herd, they did not communicate it to the "big team"? It will be borne in mind that they entered Olmstead's herd twenty-one days previous to their appearance in the "big team," and if they gave it to Olmstead's herd, this must have taken place more than sixteen days before working in the team because they then left Olmstead's. But other circumstances are still stronger against their giving it to the "big team." Five days from the time they first entered Olmstead's herd, they left and went into Doane's herd of ten head on the 3d of December, and there remained until the general slaughter, and not one of Doane's animals was sick or died. In corroboration of what has been said, we will state that these oxen were killed in Doane's herd, and the disease was accurately described.

A cow was killed that showed hypertrophy and thickened tissue; a case of pure pneumonia. The Board have been shown thickened tissue, or what was in other animals pronounced thickened tissue, but could see no disease in it.

The stags were in Olmstead's diseased herd. "Two weeks *after these* oxen left Olmstead's herd, *one* of his (Olmstead's) animals commenced coughing," &c. This was two days before the formation of the "big team." These stags could not have had much time for contracting this disease, as they must have waited till one of Olmstead's animals had gone through the incubating period. Two days for incubation and propagation beats the Pepperell cow by four days! This seems to be sufficient reason for believing that the stags did not give the disease to the "big team." Thus we hope we have found the end of the disease in this direction.

Warren S. Wood's herd in South Brookfield, consisted of ten head. A pair of healthy steers was bought of a Mr. Smith of West Brookfield, April 4th, and with the exception of a slight cough, were well. A cow was killed and examined by Dr. Dadd, May 14th, and the lung "pronounced" "hepatized and generally diseased." All the herd are well now, save those killed, (this and the Pepperell cow,) and have never been ill. The "Pepperell" cow was of this herd, stood thirty feet from these steers, separated by a plank partition. This cow left for Pepperell on the morning of the 10th, five days and a half after exposure to the steers, this being the only exposure claimed. She stopped at Holden and Lancaster, where it was supposed she had given the disease. She was killed and said to have had "the disease," but we have been unable, after diligent search to get the records of this case.

The evidence fails to convince us that this herd had the disease, because there was given no description of the appearances noticed in the cow killed by Dr. Dadd on May 14th, because neither the steers nor any other animal in the herd was ever sick, although the time for the development of the disease and the destruction of many animals had been ample. Of course, if the *herd* did not have the disease the Pepperell cow *did not* have it.

The evidence fails to convince us that the Pepperell cow carried the disease to and gave it in Holden, for if Wood's herd had it, six days would be rather a short time in which to contract and communicate it. The Dike cow which was said to have taken it of the Pepperell cow failed to give it to Abbot's cow as proved by a post mortem examination by Dr. Martin. Lyman Rice's oxen and Luther Stearns' cow that were exposed to Dike's cow, are alive and well now.

We think the evidence that Mr. Chenery's oxen gave the disease in East Lexington, and that it passed from that place to New Hampshire is defective in several particulars. First, Mr. Chenery's oxen had been well ever since the November previous. Second, the records of the post mortem made at Lexington before the extra session do not describe the disease. Third, we do not, since the panic, hear of any disease in New Hampshire, where it was said to have been carried by some young cattle from Mr. Wellington's barn. Fourth, it is quite uncertain whether the young animals that went to New Hampshire were in the barn with the Chenery oxen at all. Fifth, three cows most exposed were killed July 10th, examined by Dr. Martin and found well.

We are not convinced merely because an animal has been "pronounced" diseased by any medical gentleman, or because they said they found certain things, unless the things mentioned were accurately and carefully described. And we fear it would have been very unfortunate for the Commonwealth to have acted much farther on such evidence as the following cases will show.

Mahony had an animal killed, which the records say showed decided pleuro-pneumonia. The herd, consisting of seven head, is now alive and well.

Sullivan Convers had an animal killed. "Right lung slightly diseased ; red hepatization." The herd, of forty-two head is now alive and well.

Adolphus Hamilton had a heifer killed which was "pronounced" diseased. The herd of twenty-six head is now alive and well.

There was killed at the poor-farm in New Braintree an animal which "clearly showed pneumonia in the right lung in the early stage." The herd of sixteen head is now alive and well.

Two animals were killed, belonging to Josiah P. Gleason, of New Braintree. "The lungs of one were reported hypertrophied, especially the right ; red hepatization appearing somewhat." In the other, both lungs were pronounced "diseased in the early stage." The herd of thirty-five head is now alive and well.

An animal belonging to Peter Paranteau was killed and "pronounced much diseased." Those which were spared, six in number, are now alive and well.

A cow belonging to Warren S. Wood, of Brookfield, was killed, and "hepatization and general disease" found. The herd of ten head is alive and well now.

An animal belonging to Moses Pollard, of New Braintree, was killed and "pronounced diseased." The herd of fifty-three head is alive and well now.

In these eight herds therefore, left unslaughtered, there are alive and well now, 195 head. In every herd was found an animal reported diseased, as will be seen by the records quoted verbatim.

There were from twenty to thirty herds slaughtered, an animal in each having previously been killed and pronounced diseased by the medical and veterinary gentlemen employed at the time. The appearances, according to the records, were of the same general character as those found in the eight herds left unslaughtered.

So far, therefore, as the post mortem appearances are concerned, we have good reason to suppose that if these twenty to thirty herds, containing more than 400 head of cattle had been spared, they would all have been alive and well now; for we have already seen, that other herds, equally suspicious, never showed any sign of disease.

Inasmuch as no instance of severe disease or a single death has occurred outside of some eight or ten herds, we are irresistibly forced to the conclusion that the disease was limited to these herds.

Mr. Chenery says that fifty or sixty head of cattle were kept in the pastures adjoining his during the season of 1859, when the mortality was greatest among his animals, and yet none took the disease. But he also says that his sick animals were usually kept in the barn, and when let out rarely went far from the barn door.

This being the last fact in our possession against contagion, we will recapitulate the evidence on this side.

1. There is no clear evidence that any of Curtis Stoddard's animals took the disease of the sick Chenery calf.

2. There is no evidence that W. F. Doane's herd, or the "big team" took the disease from the Stoddard oxen which, it is claimed, gave it to Olmstead's herd.

3. Many herds were exposed to animals that had been killed and "pronounced" diseased. Eight of these herds containing 195 head, are alive and well now. And a great number of herds killed never had shown any signs of disease, but were disposed of because animals found among them had been pronounced diseased.

4. Mr. Chenery's herd were in a pasture adjoining others in which were fifty or sixty head. of cattle belonging to his neighbors, but none were ill. This is the whole of the non-contagious evidence.

The evidence in favor of contagion, recapitulated, is, that four cows from Holland were taken to Mr. Chenery's farm on the first of June. Two of them were sick and died in a very short time. A third soon followed. About the first of July, the calf sold to Stoddard appeared sick, and died about the first of August. Near the first of August a cow called Lady Louise sickened and died; then one animal after another died till the January following, at which time there had been twenty-seven deaths, in this heretofore healthy herd.

The disease is now carried from Belmont to North Brookfield not by the air, but on the railroad, by the calf sold to Stoddard. This calf is kept with Stoddard's herd during four or five days of its sickness. In twenty-four days after it leaves the herd, one of Stoddard's animals is sick; others afterward sickened and died till he lost thirteen. Then the disease sparing several herds in the neighborhood of Stoddard's, attacked a herd in which from Leonard Stoddard's were sold a pair of oxen, afterwards examined and found diseased.

At Olmstead's where the animals remained five days, nineteen days after, one of Olmstead's cows was taken sick and in rapid succession one after another sickened and died, till, between the time of exposure on December 1st, and April 11th, seven out of twenty-two head had died.

Then the disease is carried two miles by a sick cow from Stoddard's, skipping over several farms and herds, to Needham's. Twenty-one days after this animal's arrival in Needham's herd, one of the latter's cattle sickened, and afterwards others, till eight out of twenty-two died, and many more were sick.

Then the disease makes its appearance in Alden B. Woodis' barn with a yoke of sick oxen from Stoddard's, kept there for Stoddard to haul lumber. In twenty-one days one of Woodis' animals is attacked, and then others, till many were sick and four died, in the space of two months.

Then the disease appears in C. P. Huntington's herd, in an opposite direction and over several other herds, in a cow from Stoddard's, which soon died. In thirty-six days after the illness of the Stoddard cow, one of Huntington's was attacked, and afterwards others, till eight died in quick succession.

Here ends the history of the six herds, about the disease of which no one doubts. The time between the exposure and the appearance of the disease in a healthy herd corresponds in all the herds, as nearly as in most any other contagious diseases. The post mortem examinations show conclusively that it is the same disease, affecting the same organs in the same general way. No herd in the neighborhood, or in any other part of the Commonwealth, as far as is known, has been invaded by a disease, which affected almost every animal and destroyed nearly 30 per cent., unless they have been exposed to animals whose disease can be traced in a direct line to the Holland cows. By slaughtering these diseased herds, its extension was at once prevented.

After weighing carefully all the evidence that can be obtained, we are forced to conclude that this is a contagious disease, and all legislation should be based upon that understanding until future developments show the contrary.

1st. The fact, that Mr. Curtis Stoddard's cattle did not take the disease, or those that did not go into his father's herd, (of them we can tell nothing,) may perhaps be accounted for by the calf standing beside a passage, the two ends of which had two large doors, large enough for a cart and oxen to pass through, which doors usually were left open in the summer.

2d. Why the "big team" and Wm. F. Doane's herd did not take it of the Stoddard oxen, can be accounted for only by believing that these oxen had probably passed the propagating period. If it be asked why its contagious property was not shown in many herds pronounced diseased, we can only answer, that the evidence fails to convince us that these specimen animals were diseased. If it be urged still further that fifty or sixty animals surrounding Mr. Chenery's farm escaped, it must be remembered that his cattle were usually kept isolated in the barn, and when let out remained near it. His farm is on the top of a high hill, over which a strong breeze usually sweeps, and the farms surrounding are on a lower level.

INCUBATION.

Basing our calculations upon facts derived from herds where the disease undoubtedly existed, we arrive at the following conclusions, in regard to the time of incubation :—

W. W. Chenery's herd (Stoddard calf,)		29	days.
Leonard Stoddard's herd,		28	“
Alden Olmstead's	“	19	“
A. A. Needham's	“	27	“
C. P. Huntington's	“	36	“
Alden B. Woodis'	“	21	“
Divided by		6) 160	days.
Average time of incubation in these six herds,		$26\frac{2}{3}$	days.

In the case of the Chenery calf, we have allowed the longest possible time after exposure. And the same rule was adopted in reference to the cases of Leonard Stoddard, A. A. Needham, and Alden Olmstead.

In the cases of C. P. Huntington and Alden B. Woodis, the longest reasonable time after exposure was allowed.

In the first four cases the time of incubation could not have been over that stated; in the two last it was reckoned from the time when the new-coming animal began to show signs of sickness.

The Chenery Stoddard calf showed the first signs of sickness 29 days after the arrival of the Holland cows at the farm.

Leonard Stoddard's first cow was attacked 28 days after the introduction of the sick calf into his herd.

Alden Olmstead's first case occurred 19 days after the entrance of the sick oxen into his herd.

A. A. Needham's first animal was taken sick in 27 days after the sick Stoddard cow entered his herd.

The four cases making an entire period of 103 days, which, divided by four, gives $25\frac{3}{4}$ days as the average time of incubation.

The time of incubation could not have averaged more than 25 days—but it might have been less, as an animal might not take the disease during the first few days of exposure. The Olmstead cattle must have contracted the disease 14 days before the first sickness appeared in this herd, inasmuch as the diseased oxen were removed 14 days before any animal belonging to it was sick. The probable time of incubation is from two to three weeks.

The evidence we have in regard to contagion and incubation, although limited, is perhaps more to be relied upon than that in Europe, where the disease has so extensively prevailed, that there would be more chances for unknown exposures.

PROPAGATION.

The mode of propagation is very uncertain. Whether the disease is produced by infection from the saliva, by bringing noses in contact, or by the breath, secretions from the skin or excretions of the body, is quite far from being finally settled. It is difficult to say how long an animal may continue to communicate the disease; if he has not done so, it does not follow that he cannot.

The Doane oxen, that gave the disease to Olmstead's herd, could not have been exposed much before August 1st. They went into William F. Doane's herd on December 3d, and did not give the disease. Therefore months cover the time of incubation and propagation. But these oxen were never off their feed, and did not appear much sick at any time. And had they not given the disease to Olmstead's herd, and been examined post mortem, they might never have been considered ill.

Chenery's oxen were ill and apparently recovered, in November, 1859. In April, 1860, they stood near three cows in the barn in East Lexington, at Mr. Wellington's, while some hay was being loaded. These three cows were afterwards killed and found sound, July the 11th following.

Here is all the evidence that we have in regard to the length of time during which an animal can give the disease. It may be taken for what it is worth.

Eight weeks, it would seem, ought to cover its period of incubation and propagation. Twelve weeks would probably be safer to act upon. But not being informed upon the subject, we cannot give a positive opinion. There is but one case, (as far as we have read,) on record, foreign or domestic, in which it was communicated during convalescence, and here the animal drooled, and did not appear entirely well.

THE SYMPTOMS.

The symptoms of the disease are such as we meet in pleuro-pneumonia in general. Hair rough and staring, frequent shivering, cough, grunting, and other indications of pain, quick pulse, sometimes drooling, and more or less dyspnea, according to the extent of the disease and the existence of effusion in the pleural cavities. Death seems to be produced, not so much by the nature as the extent of the disease. Every animal, as far as we can learn, that has died, or was so near death as to be killed to prevent hopeless suffering, had disease of both lungs, and serum in both chests. In the late stages of the disease some of the animals had a copious watery diarrhœa; others, we have been informed, were constipated. But it must be borne in mind that some animals whose lungs are quite extensively affected, give it to others without ever appearing ill themselves. That was the case with the cow Princess, in Mr. Chenery's herd. The cow Victoria had breathed badly, and showed other signs of ill-health. She was slaughtered October 16, 1860, and examined by Drs. Martin, Ellis, and Stickney.

In the right side of the chest were two enlarged glands; both were filled with yellow caseous matter. The right lung contained many small nodules, composed of the same yellow caseous material. The posterior lobe of the left lung contained a similar mass as large as two fists, and others of smaller size. It was supposed that this animal had never been exposed to the disease, as she had only come in contact with a healthy bull at the farm. But on inquiry, we learned that the cow Princess, as she appeared well, had been taken down to Mr. Chenery's home barn, and had stood for a long time beside Victoria. This cow Princess had shown no signs of illness, except a slight cough. To throw light on the subject, she was killed and examined by Drs. Martin, Ellis, and Stickney, October 16, 1860.

The right lung adhered to the four anterior ribs, but showed no disease. The left lung contained one yellow caseous mass as large as the fist, and a large number of smaller ones which occupied the greater part of the posterior lobe.

The oxen that were supposed to have given the disease to Olmstead's herd were never ill, but the post mortem examination shows they were very much diseased. These, with quite a number more killed in Mr. Chenery's herd, show that animals may have quite extensive local disease, without any general symptoms of ill-health, as many persons have the measles and smallpox without losing their appetites, or being otherwise indisposed. But the local trouble in pleuro-pneumonia is internal, and would be perhaps overlooked. Hence any action based upon the apparent good health of an animal in a sick herd, might become very dangerous to the interests of the Commonwealth. And we will add here that very important facts have been ascertained, by killing from time to time, animals belonging to the Chenery herd. The cattle attacked usually die in two or three weeks, or begin to improve where recovery is to take place.

THE TREATMENT.

Of course, if the disease is contagious, as we think it is, no one will expect to cut it short. We do not talk of curing a case of smallpox or measles. But most physicians think they can do much to make their patients comfortable, to prevent various complications, and thus contribute to the safety of many. So in this disease, every thing that can be done to soothe the feelings of the animals, to sustain their strength, to remove costiveness, or to prevent diarrhœa, will do much to lessen the average fatality. But if the function of both lungs is destroyed by induration, there is of course no chance for recovery.

When one side of the chest is sound and the other so filled with serum that the function of one lung is suspended, and that of the other essentially interfered with, the animal could, in all probability, be saved, if the fluid could be withdrawn by a judicious practitioner. We here beg to protest against indiscriminate medication. It is much safter to trust to nature than to uncertain remedies.

AVERAGE FATALITY.

But one herd has been left to run through the disease before slaughtering, and of course the results are not so satisfactory as if they were based upon observations on many herds. But such as we have we give.

Mr. Chenery's herd ran through the acute stage of the disease pretty much unmolested, and 27 animals died out of 67; about forty per cent.

There were probably diseased 51 out of 67—a trifle more than seventy-five per cent., or 3 out of 4 animals.

The relative value of the animals in herds affected, that do not die.

The tendency to entirely recover is less than was supposed by the senior member of this Board. Whether the nine animals found free from disease, after slaughter, in Mr. Chenery's herd, were sick and had entirely recovered, or had never had the disease, it is impossible for us to say. But so far as we could judge from what we saw, the tendency to a removal of the diseased substance is very slight, and it is fair to presume that if the parent's constitution is injured by this or any other disease, a like constitution may be transmitted to the offspring. Their value as breeders would, therefore, be much diminished, but,—as the following statements show,—they may be used for beef without danger, and the milk is harmless.

According to Delafond, when animals affected with acute or sub-acute pleuro-pneumonia are slaughtered in a proper manner, their flesh is found to be of a beautiful red color, firm, without effusion, either bloody or serous. It makes a good broth and the boiled meat is savory and digestible. If roasted, there is no more serosity or juice than from the meat of a healthy animal. If salted, it takes the salt well and is well preserved. J. B. Huzard states that in 1789, when the disease was most fatal, the flesh of animals attacked by the disease was eaten with impunity. Many other authors, among whom are Benoist, Hanemann, Bojarus, Dieterichs, Hoffacker, Wagensfeld and Krheyen admit that the meat is not essentially injurious to man. Delafond himself ate the meat boiled and roasted, and on one occasion made a breakfast of liver taken from a cow killed the evening before, and was not at all affected by it. Several others did the same thing without the slightest inconvenience. Daily, at Paris and elsewhere, animals attacked by the disease are killed at the slaughter-houses, and the sale of the meat is authorized (1844,) as *basse viande.*

The writer, notwithstanding, thinks that the sale of such meat should be under strict control, as great abuse might otherwise arise. It would certainly be wrong to authorize the sale of meat from a sick animal, but there is no reason to believe that injury would result from using as food the flesh of those which had recovered, or had been simply exposed.

Although it is not probable that the disease can be communicated by the dung, Delafond thinks it prudent to allow it to remain in a secure place sometime before using it.

The milk has never been known to produce disease.

PREVENTION.

The subject of inoculation has been much discussed and appears to be very properly treated in the following extracts:—

Professor Simonds and Morton of London, were appointed in July, 1852, by the English government to pass over to the Continent and report upon the results of inoculation. During the latter part of September, 1852, they were guests of M. Willems.

The result of the report of "Dr. C. Ulrich, Veterinarian of the Circle of Urietzen Sur l'Oder, Professor at the Royal Academy of Mœglin," is rather unsatisfactory. He mentions, however, one case where 191 head were inoculated and cured by Dr. Désaire; 30 lost the whole or part of their tails; and he further remarks, "that the loss of the tail has been in the ratio of 3 out of 11; 10 out of 22; 12 out of 50; 13 out of 51; and in one case, even all of 13 inoculated."

Prof. Simonds gives the following conclusions:—

1st. That inoculation made by superficial punctures and simple erasions of the skin, invariably fail to produce any local inflammatory action, being the reverse of the case with regard to vaccine disease, smallpox and other specific affections, of which it is an indication of success.

2d. That the employment of *fresh*, serous, and cleanly made, but *small* incisions, during the continuance of a low temperature, will also, almost always, fail to produce even the slightest amount of inflammation.

3d. The deep punctures are followed by the ordinary phenomena *only* of such wounds, when containing some slightly irritating agent.

4th. That with a high temperature, roughly made incisions, and serous fluid a few days old, local ulceration and gangrene, producing occasionally the death of the patient, will follow inoculation.

5th. That the *sero-purulent matter* taken from an inoculated sore, causes more speedy action than the *serum* obtained from a diseased lung, and that "*removes*" cannot be effected on scientific principles.

6th. That oxen are not only susceptible to the action of a *second*, but of *repeated inoculations* with the serous exudation of a diseased lung.

7th. That an animal inoculated with the serous exudation is *in no way protected, even from the* repeated action of the sero-purulent fluid which is produced in the wound as a result of the operation.

8th. That animals not naturally the subject of pleuro-pneumonia, such as donkeys, dogs, &c., are susceptible of the local action, both of the serous exudation from the lung and the sero-purulent matter obtained from the inoculated wounds.

9th. That the serous fluid exuded from the lungs is not a specific "virus," or "lymph," as it is sometimes designated.

10th. That inoculations made with medicinal irritating agents will be followed by similar phenomena to those observed in inoculations with the exuded serum.

11th. That inoculation often acts as a simple issue, and that the security which at times the operation apparently affords, depends in part upon this, but principally on the unknown causes which regulate the outbreak, spread and cessation of epidemic diseases.

12th. That inoculation of cattle, as advocated and practiced by Dr. Willems and others, is not founded on any known basis of science or ascertained law, with regard to the propagation of those diseases commonly called specific.

13th. That pleuro-pneumonia occurs at various periods of time after a so-called successful inoculation.

14th. And lastly, that the severity of pleuro-pneumonia is in no way mitigated by inoculation, the disease proving equally rapid in its progress and fatal in an inoculated as in an *un*inoculated animal.

We will also refer to the General Resumé of the Report of the Scientific Commission (Veterinarian, vol. 27, pp. 339–343,) and give their conclusions respecting inoculation, viz.:—

1st. Inoculation with the liquid extracted from the lungs of an animal laboring under peripneumonia, does not convey to others in health, of the same species, any disease, at least in its seat, similar to that from which the inoculating fluid was taken.

2d. The appreciable phenomena, following inoculation, are those of a local inflammation, light and confined to the place of inoculation, in a certain number of inoculated subjects. Grave and diffuse, accompanied by a general reaction, proportioned to the intensity of the local action, and complicated with gangrenous accidents which may cause the death of others.

In the experiment made by the Committee, inoculation has proved benignant in its effects, in 61 out of a 100 of the inoculated subjects; grave and complicated with gangrenous accidents, in 38; mortal, in 11; 88 subjects out of a 100 have consequently recovered their health after inoculation—61 without presenting any traces of the operation they had undergone, and 27 with exterior local lesions, more or less extensive and marked, according to the intensity of the gangrenous affection to which inoculation had given birth.

3d. Inoculation with fluid taken from the lungs of animals suffering under peripnuemonia *possesses a preservative virtue*—it invests the organism of the greatest number of animals on whom it is practiced with an immunity which protects them against the contagion of the disease for a period of time remaining to be determined, but which the experiments detailed above do not show to be less than six months.

The following table presents to the eye the calculated results afforded by the two sets of experiments on inoculation and cohabitation instituted by the Committee:—

COHABITATION.		INOCULATION.	
Number of subjects of experiment being supposed to be	109.	Number of subjects of experiment being supposed to be	109.
Cohabitation will be *nil* in its effect, or very benignant for	54.34	The inoculation would be beneficial for	61.11
And more or less hurtful for	45.65	And more or less hurtful for	38.88
In this last account the recovery will be represented by	36.95	In this last calculation, the recoveries will be represented by	27.77
And the deaths by	8.69	And the deaths by	11.11
As a definite result, the number of animals, departing from the tests of cohabitation with their health saved or recovered, will amount on an average to	91.29	As a definite result, the number of animals departed from the tests of inoculation with their health saved, or recovered, will amount, after this calculation, on an average to	88.88
And the dead to	8.69	And that of the deaths to	11.11

The first fact which strikes us in this table is, that inoculation has occasioned a greater mortality than the disease it was designed to prevent. Besides we must take into consideration that animals who have borne up against the gangrenous results of inoculation have still lost much of their value after their cure, in consequence of their health being impaired for a long time. They are also deformed, by the loss of a part of their tails; while on the contrary, cows which under the experiments of the Committee have contracted peripneumonia and been cured, have recovered at length very nearly their former value —the disease leaving no apparent trace behind it, nor having in any way injured the animal, either for lactation or fattening.

These being the results of inoculation, we cannot advocate its adoption. It is evident therefore, that the only effectual means for arresting the progress of the disease is to slaughter every herd in which it exists. But how to tell where it exists is a much more difficult task. Therefore, when an animal from any suspected region coughs and shows other symptoms of disease in the chest, it should be separated from its fellows and the herd should be strictly isolated. If the affected animal should die, it should be carefully examined, and an accurate record of the appearances made. Should the disease be one of the chest, the rest of the herd should be inspected daily, and if other animals are successively attacked and die, they should be examined, and if found to be affected with the same malady, the safest way would be to "extirpate" the herd.

We cannot, therefore, award too much praise to the Commissioners, for the fearless manner in which they have performed their duty, in spite of the popular clamor, excited by what appeared to be an unnecessary destruction of animals. To pause until men agree upon the subject of contagion, would perhaps establish the disease among us.

Admitting that it is still an open question, let us be prepared to act on the weight of evidence, and, until the scale turns, extirpation should be regarded as the only sure means of prevention.

As the disease prevails in Great Britain and Europe, it is highly important that Congress should pass quarantine laws to prevent its re-introduction into this country.

Oramel Martin, M. D.,
Calvin Ellis, M. D.,
Josiah H. Stickney, M. D.,
Board of Examiners.

At a meeting of the Board of Agriculture held at the State House on the eleventh of December, 1860, Mr. Sewall, in behalf of the Committee appointed to coöperate with the Commissioners, submitted the following

REPORT:

The Committee appointed by the Board of Agriculture at the request of the Commissioners on the Cattle Disease, to advise with and assist said Commissioners in the discharge of their duty, respectfully Report:—

That immediately after their appointment they proceeded to North Brookfield, in which place and its vicinity, the Commissioners were then prosecuting their work, and advised with them in relation to an application to His Excellency the Governor of the Commonwealth to issue his summons for an extra session of the legislature, recommending that measure under the exigencies of the case.

That they subsequently made application to His Excellency in behalf of said Commissioners, and also by their authority visited several towns, to which they had been summoned to investigate cases of disease or of apprehended exposure to it.

That from time to time, as the necessities of the case demanded, they have been occupied in carrying out the purposes of their appointment. And that of all their doings in connection with, or in behalf of the Commissioners, a full report has been transmitted to them to be communicated to the legislature, to which report they beg leave to refer for more extended information of the discharge of their duty.

The Committee having had large opportunity to observe the course pursued by the Commissioners, take pleasure in expressing the conviction, that to the late action of the legislature, enlarging the powers of the Commissioners and the means at their disposal, followed by their own wise and energetic prosecution of a work attended with much difficulty and pain, is to be ascribed the probable extermination of an evil of the most threatening aspect to the interests of agriculture and the common welfare of the country. The judgment of the Commissioners has been in some quarters disputed, their motives have been impeached, their characters maligned; but we are fully convinced that the indebtedness of the Commonwealth to the Commissioners cannot easily be discharged.

For the Committee,
CHARLES C. SEWALL.

The introduction of the disease, alluded to in the preceding pages, among our neat cattle, has very naturally directed attention to the raising, management and profits of sheep as compared with other farm stock. The Committee of the Board appointed to collect information upon that important subject submitted the following

REPORT

ON SHEEP HUSBANDRY.

The Committee of the State Board of Agriculture, appointed to collect material and report upon the sheep husbandry of Massachusetts, issued eight hundred of the following circulars, which, through the agency of the members of the Board, were distributed through every town in the State.

It is discouraging and mortifying to know, that to these eight hundred circulars only eleven replies were returned, except from the county of Franklin, where, by unusual exertion and continued solicitation, replies were obtained from every town.

To those who did take the pains to make full answers to our circulars, the Committee are under obligations. One return was received from Berkshire; two from Martha's Vineyard; three from Hampshire; one from Plymouth; four from Worcester, and twenty-six from Franklin.

The Committee sent out the following circular:—

SIR,—The Massachusetts "State Board of Agriculture" desires information upon the subject of Sheep Husbandry, and proposes the following questions to the Farmers of the State.

You would confer a favor and assist the cause of Agriculture, if you would take the pains to answer the questions, and to make such experiments or inquiries as may enable you to answer them more fully.

You will be kind enough to return your answers in the inclosed envelope, on or before November 15th, directed to Charles L. Flint, Secretary of the Board of Agriculture, Boston, Mass., with the name of the subject or subjects upon which you have answered, indorsed thereon.

1. How many sheep are kept in your town?
2. How many fine wooled?
3. How many of each different breed are there?
4. How many sheep have you?
5. Of what breed are they?
6. How many acres do you pasture to sheep?
7. How many sheep to the acre do you pasture?
8. Do sheep in your opinion improve pasture lands?
9. What is the cost of summering sheep, including pasturing, washing, shearing, tarring, salting, &c.?
10. How are your sheep housed in winter?
11. How do you feed sheep that are fattening?
12. How do you feed your store sheep or ewes?
13. At what time do you prefer to have your lambs dropped, and the reason why?
14. How do you feed lambs for market?
15. At what age do your lambs go to market?
16. What is the average value of your ewes?
17. What price do your lambs fetch?
18. What do you estimate the cost of keeping your store sheep or ewes through the winter?
19. What is the cost of feeding the lambs?
20. When do you send your fat sheep to market?
21. What gross sum do they average you?
22. When do you shear your sheep?
23. What is the average weight of your fleeces?
24. How often do you salt your sheep?
25. Do you use tar for your sheep and how?
26. How much manure do you get from any given number of sheep?
27. What is the value of it as compared with the common stable manure?
28. Have you suffered from any disease among your sheep?
29. If so, what is the disease and what is your remedy for each disease?
30. What is the amount of damage done to sheep in your town by dogs this year?
31. Has the destruction of sheep by dogs prevented sheep raising?
32. Can you state to what extent?

Please state at length any experience of your own which may be of interest.

J. S. GRENNELL,
S. H. BUSHNELL,
CYRUS KNOX,
R. S. FAY,
Committee of the Board.

BOSTON, March 1, 1859.

The subject of sheep husbandry, always one of the greatest importance to the whole farming community, has received such additional interest and attention at this time, from various causes, that in the opinion of the members of the Board of Agriculture, a somewhat extended space should be devoted to its consideration. In attempting this, not easy task, the members of the Committee to whom the examination of this matter was referred, although all sheep-owners themselves and directly engaged and interested in it, feel most sensibly their inability to discharge this duty as it should be done; they cannot expect in a community of farms like ours, percolated as it is through every family by agricultural papers and books, ripe with the experience of hundreds of others besides themselves, to offer any thing original or interesting, to any except those directly concerned. If by a judicious selection and collation of the opinions of men of large experience in sheep-growing, whether from replies to their circulars, and other communications, books, or personal experience and information, they can more directly than has been previously done, bring this subject to the notice of the farmers of this Commonwealth, and excite any permanent interest in the breeding, keeping and feeding of this most useful animal, by encouraging those already engaged in it, or by stimulating and inducing others to undertake it, they will feel that their labors are not unavailing.

STATISTICS.

The census statistics and the returns we have received show some remarkable facts in the sheep husbandry of Massachusetts, especially in the rapid decline of wool-growing.

In 1840, the number of sheep was 378,226; in 1845, 354,943; in 1850, 188,651; in 1855, 145,215; in 1860, 113,111—showing the astonishing decrease in twenty years of 265,115 sheep.

In 1845, the number of pounds of wool grown was 1,016,230; in 1855, 416,156—a loss of over 600,000 pounds.

In 1845, the total value of all the sheep and wool was $923,420; while, in 1855, only ten years later, it was $464,889—showing a depreciation of that stock in ten years of nearly half a million of dollars.

In 1850, the wool produced in the Commonwealth was 585,000 pounds; the amount consumed, outside of domestic manufactures or household products, was over 22,000,000 pounds. This fact also appears, that the sheep husbandry of Massachusetts is tending, with a remarkable directness and rapidity, to the growing of coarse and middle-wooled sheep for their flesh, and to the exclusion of those breeds raised only for their wool, all over the State, except on the mountain ranges in the western part, where remoteness from market, and extensive tracts of rough pasture will still maintain a limited number of merino flocks. While in 1845, the fine-wooled sheep numbered about 200,000, or 45,000 *more* than all others; in 1855, they numbered only 72,390, or 435 *less* than the coarse and middle wools. We have no figures for 1860 to show exactly how the loss of 32,000 sheep since 1855 is divided, but by taking the same ratio, and also by a careful examination and comparison of the returns from the different towns in the State, especially in Berkshire, formerly the great home of the fine wools, and which alone shows a decrease of 22,000 in that time, it is probable that on the first of May last, the coarse and middle-wooled sheep exceeded the fine-wooled by full 10,000.

Among the several causes to which these great changes in sheep husbandry are traceable, are the fluctuations in the price of fine wool, varying from 54 cents down to 28 cents during twenty years; the uncertainty of disposing of the clip; the impossibility of competing with the immense sheep-walks of the West and South, and Australia; the disproportionately increased expense, trouble and losses in a large flock of fine wools, over a smaller and more profitable flock of mutton sheep; the ready sale and quick returns for mutton and lamb; and the destruction of sheep by dogs.

The returns from the various towns state, almost without exception, that the killing and worrying of sheep by dogs have tended largely to reduce the keeping of sheep; the testimony to this was so universal and so decided, that the legislature two years ago passed a stringent and effective law,—from which we already perceive benefits, taxing all dogs, and from the fund so made, paying all losses caused by the destruction of sheep by dogs. Few persons are aware how destructive dogs are to sheep. We have never had any returns in this State as to the amount of damage done by dogs; but in Ohio, in 1858, the number of sheep thus killed was 60,536; of sheep injured 36,441—total damage done to sheep by dogs, $148,748. The effect of the present law by imposing a tax upon the animal is to destroy that class; and the tax, though small, is quite sufficient to cover the losses by those which are left; the provisions of the law are such, that it is easy of enforcement, and we hope every farmer in the State will interest himself in seeing that it is executed in his own neighborhood. The difficulties which beset the cultivator, especially in populous neighborhoods, are quite enough from trespasses and depredations of various kinds, without being obliged to watch his flocks by day and by night; losses of this nature can only be guarded against by a law of the description which has recently been enacted. From returns received from various towns of the Commonwealth, it appears that in 1859 about 33,000 dogs were licensed, paying a tax of over $36,000; it is estimated that nearly an equal number was destroyed by their owners as not being worth the tax, and that as many more escaped taxation altogether.

By a faithful adherence to this law, perhaps this impediment to sheep-growing may be overcome; but we hope to see the day, when no dog, going at large without his master, will be tolerated.

The growing of sheep has ever been regarded as a most profitable branch of farming, producing the largest returns, in the shortest time, from the smallest investment, and hence sheep have usually constituted a very considerable portion of the capital stock invested in the business of farming, and this is increased by the enlarged facilities for transporting the animals to market, both on the hoof and in the carcase.

Among the reasons which have served to create a present current in favor of sheep-growing for their flesh in this State, is the great uncertainty and frequent loss in feeding cattle; such are the present and constantly increasing facilities for the transportation of cattle from the West, where the cost of raising is merely nominal, that it is becoming impossible for our farmers to compete with western feeders; and if it were not for the manure, which fattening cattle leave, and which is almost the farmers' sole dependance for their coming crops, very few would attempt to fatten cattle. The demand for wool is now increasing, and the prices more uniform than for many years previous, and this particularly applies to the class of middle and coarse wools, which find a surer and steadier market than fine wools.

The prevalence of the pleuro-pneumonia among the cattle of this Commonwealth, has in a very marked manner turned the attention of farmers to sheep raising, as being a safer, as well as more profitable investment. Whether or not this malignant and dangerous disease has by the courage and energy of the Commissioners been extirpated, remains to be determined this winter, but the alarm which it occasioned, and the fear of its recurrence, will not soon be forgotten, and will lead many farmers to stock with sheep rather than cattle.

Perhaps, however, the most satisfactory reason is to be found in the steady, gradual demand for mutton and lamb in our markets; this increase has been in a much greater ratio than the population, showing that the people of the country, are coming to appreciate that most excellent of meats.

At Brighton, on the market day previous to Christmas, 1839, two Franklin County men held four hundred sheep, every one in the market, and yet so ample was that supply, and so inactive the demand, that they could not raise the market a half cent a pound, and finally sold with difficulty; just twenty years after that at the same place, on the market day previous to Christmas, 1859, five thousand four hundred sheep changed from the drover to the butcher.

For the production of a cheap, wholesome, and highly nutritious food, no animal excels the sheep; theoretical considerations as well as careful experiment show mutton to be quite equal to beef, and superior to pork or other meat in the production of vigorous muscle.

Mutton and lamb are favorite,—if not the favorite food of the English and Scotch of all classes; notwithstanding all that has been said or written of the "roast beef of old England," mutton according to the best authority is more eaten by people of every rank. The Scotch laborers are certainly among the most active, robust, clear-headed, healthy men we see, and they have no meat but mutton. The English, the most robust, and healthy-looking of all people, owe their fine appearance not more to the humidity of their climate, than to the mutton constituting more than one-half of their animal food. On the other hand, it certainly has not been a favorite food in the United States, though its proportionable consumption is evidently increasing; the difference may be largely attributed to circumstance, which has led to habit and habit regulates the appetite to a great extent. The circumstances may be partly these; that until within a very few years we have never had any of the real mutton sheep to eat; our old native stock was poor, and the merino infinitely worse; the sheep formerly killed were too often old and poor, and the cheapness of the animals too frequently brought them as food to those who were compelled to eat them; farm-laborers, servants, apprentices, and others, learned to thoroughly dislike mutton, and many a man and woman so far advanced as to have perhaps every other recollection of school days wiped from the memory, still retain in the most lively manner the disgust created by the inevitable, daily mutton of the boarding-house;—with them "the full soul loatheth the honey-comb."

The experiments of Dr. Beaumont, and other physiologists, show that mutton is more nutritious, digests more easily and assimilates more readily to the system, than any other meat we are in the habit of consuming.

While mutton is regarded as the most nutritious meat, it also is the most economical to purchase at the usual prices. English chemists and philosophers by a series of careful experiments, find that 100 pounds of beef, in boiling, lose 26½ pounds, in roasting, 32 pounds, and in baking 30 pounds, by evaporation and loss of soluble matter, juices, water and fat. Mutton lost by boiling, 21 pounds, and by roasting, 24 pounds; or in another form of statement, a leg of mutton costing raw, 15 cents, would cost boiled and prepared for the table, 18½ cents per pound; boiled fresh beef would at the same price, cost 19¼ cents per pound, sirloin of beef raw, at 16½ cents, costs roasted, 24 cents, while a leg of mutton at 15 cents, would cost roasted, only 22 cents.

These facts have not only been long known and demonstrated by English and French philosophers, but have been actually and practically understood by the people, and certainly are worthy the consideration of our own countrymen.

The taste for, and consumption of mutton, will increase according to the quantity and quality of the production. Mutton can be raised much cheaper than beef or pork. Mr. Mechi says he is "convinced that beef must sell 20 per cent. higher than mutton to make them pay alike." When our farmers find the demand for mutton increasing according to their exertions to make it good, that they can raise it a quarter cheaper than they can beef, and that it is better husbandry to get a hundred pounds of mutton from one sheep than from two, and that the quality of that will be a controlling condition, then we shall have them in our State cultivating the best breeds of English mutton sheep, to the comfort, profit and health of the whole community, as well as of themselves.

Another very important consideration which should move for the raising of more sheep, is the beneficial effect they produce upon pastures.

We are all too well aware of the impoverished condition of most of the pastures of this Commonwealth, and of the very important place which good pasturage holds in agriculture. To the question proposed in our circular whether sheep improved pasture land, there has been from every return, but one unequivocal "yes, especially on those pastures where the coarse grasses, briars and bushes are coming in." To quote from a very able essay by the Secretary of the Massachusetts Society: "Our own observation and experience has fully confirmed the correctness of the returns in this respect. We have constantly under our eye a hundred acre lot upon which cattle a few years ago could not live, that now maintains in good condition a large flock of sheep; and the improvement of the pasture has been so great that a dozen head of cattle beside the sheep do well on it.

"The reasons for this are obvious to any one who has observed the habits of sheep; they are more indiscriminate feeders than cattle; they nip the shoots of almost every shrub as well as weed, extirpating many kinds in the course of two or three years; they make room in this way for the grasses to come in where they have been shadowed out or otherwise displaced; the white weed, the broom or wood-waxen as it is commonly termed, the golden rod, the blackberry vine, the blueberry, with many other similar plants, disappear before them, and the finer grasses and white clover take their place.

"This, however, is only one of the advantages which sheep possess over cattle upon pastures which are impoverished,—they scatter their manure in the way to produce the largest benefit, besides which, it possesses in the highest degree the requisites essential to restoring to the land the phosphates which it loses by long depasturing with cattle.

"The manure of the sheep, too, suffers no waste, being in a highly concentrated form, and at the same time it is minutely divided and evenly distributed over the surface of the ground. So good and economical a distributor of manure is the sheep, that experienced farmers in England are feeding them when in pasture with oil cake, for the additional benefit of the manure."

Another important consideration in raising sheep rather than cattle, or horses, is that they can be "turned" or sold at a much less comparative sacrifice than any other stock, if by shortness of pasturing, or money, or for any cause, the owner finds it necessary to reduce his stock; and in case of accidents or deaths in a flock, the loss is not as with other stock, a total one—the pelt bearing a large proportion to the living value of the animal; sheep, too, can at any time of the year be replaced, but cattle cannot always be bought.

BREEDS OF SHEEP.

Without going into a particular and elaborate history of all the different breeds of sheep, a brief sketch of those now found in New England may not be uninteresting. We find mention of sheep very early in the history of the Colonies, but by whom imported, or from what localities in the mother country, or from what breeds, we have no information. As early as 1658 Mr. John Josselyn, in his "Voyages," speaks of there being seven or eight hundred sheep in the town of Blackpoint in this Province.

In 1676, Sir Edmund Randolph, one of the provincial governors, mentioned in his correspondence to the home government, that New England abounded in sheep. The descendants of these sheep known in our day as "native sheep," in distinction from the breeds of known importaton, were of two kinds—one with white faces, and the other with dark faces and legs; the first seem to have been preserved in the eastern part of the State and on the islands, while the latter have been known in the valley of the Connecticut by the name of "English smuts," or "Irish smuts." These last may have been South Downs imported before the improvement of that celebrated breed, as they bear many of their characteristics, and might, had they been bred with the care and perseverance which the South Downs received, have been a most valuable breed.

Our ancestors emigrated from different parts of the United Kingdom, and some from the various countries of Europe. They brought with them their implements of husbandry, and domestic animals to fertilize the wilderness. Each, it would be natural to suppose, made choice of the favorite breed of his own immediate district to transport to the new world, and the admixture of these various breeds formed the mongrel family called native sheep. Amid the perils of war and the incursions of beasts of prey, these were preserved with attentive care.

These common sheep yielded a wool only suited for the manufacture of the coarser fabrics, averaging in the hands of good farmers not over three and a half pounds of wool to the fleece. They were slow in arriving at maturity, compared with the improved English breeds, and yielded, when fully grown, only from ten to fourteen pounds per quarter of a middling quality of mutton, which was, however, in very slight demand. They were usually long-legged, light in the fore-quarter, and narrow on the breast and back, although some instances might be found of flocks with short legs, and some approximation to the general form of improved breeds. They were hardy, easy keepers, and excellent breeders, often rearing, almost entirely destitute of care, and without shelter, one hundred per cent. of lambs, and in small flocks a still larger proportion ; these were usually dropped in the months of March and April. Restless in their disposition, their impatience of restraint almost equalled that of the untamed sheep of the Rocky Mountains, and in many parts of the country it was common to see flocks of from twenty to fifty of these, roving with little regard to inclosures, over the possessions of their owner and his neighbors, leaving a portion of their wool on every thorn and bush.

The old common stock as a distinct family has nearly disappeared, having been crossed to a greater or less degree with the foreign breeds of later introduction. The first cross with the Merino resulted in a decided improvement, and produced a variety exceedingly valuable to the farmers who grew wool for domestic purposes ; the fleeces were of uneven fineness, being hairy on the thighs and dewlap, but the general quality was much improved, and the quantity considerably augmented; the carcase was brought nearer the ground, and rendered more compact, and they lost some of their unquiet and roving disposition.

The cross with the Saxonies for reasons to which we shall hereafter allude, has not generally been so successful. With the Leicesters and Downs, so far as size, form and a propensity to take on fat are concerned, it is manifest that they are much improved. They are so hardy, thrifty, and such good nurses, that they make an excellent cross for lambs with a South Down or an Oxford Down ram. Lambs of one of the Committee by an Oxford Down ram out of dark faced native (or as they are called, "Irish" or "English smuts,") at sixteen weeks old, dressed from forty to forty-eight pounds, from milk and grass alone. Till after the Revolution, such sheep furnished all the wool used in the country for domestic purposes, and the fine cloth was all imported from England; the meat was not in general favor, and but little eaten. Had they been bred with any thing like the skill and patience manifested by Bakewell, and Ellman, to improve the good points, and to correct the bad ones, they would have become a breed answering all our requirements for mutton and lamb, and we should never have been obliged to go to England for our sheep.

From a very early period in English history, as early certainly as the twelfth century, sheep, wool and all the manufactures of that article, were by legislation and royal edicts carefully fostered and sedulously encouraged, and as a part of the same policy, they were ever in an equal degree discouraged and frowned upon in the colonies of that powerful and far-seeing nation.

MERINOS.

At the close of the war with Great Britain, then, we found ourselves not only without manufactories of woollens, but also destitute of the material upon which to work; the attention of our statesmen was early directed to supply this deficiency, and they wisely looked to the Merinos of Spain to do it, but it was with great difficulty that the Spanish government could be persuaded to allow any exportation of them. In 1793, the late Hon. William Foster, of Boston, then a young man travelling in Spain, smuggled a ram and two ewes on to the ship Bald Eagle, Capt. John Atkins, and after a long passage and some sickness, landed them safely in Boston and gave them to his friend Andrew Cragie, Esq., of Cambridge; there being then no manufactories, and perhaps no proper appreciation of their splendid fleeces, and being probably a trouble to Mr. Cragie, he killed and ate them; fifteen years after that time he paid for similar sheep $1,000 a piece. Gen. David Humphreys, of Connecticut, in 1802, when Minister to Spain under Mr. Jefferson, imported a flock of two hundred, which he bred and increased with such success as in 1807 to have made several hundred yards of fine cloth, for which he received a gold medal from the "Massachusetts Society for Promoting Agriculture." Some of those sheep were brought into Franklin County at that time by Capt. David Dennison, and the direct blood of that stock exists there to this day.

Chancellor Livingston, of New York, imported a few, and in 1809–10, the late Hon. William Jarvis, of Wethersfield, Vt., commonly known as Consul Jarvis, imported very largely, and to him more than any one, is due the rapid advance in manufactures of fine wool, which were pursued with more zeal than discretion; for every other branch of agriculture suffered from the undue importance attached to growing fine wool.

The attention of the country was about that time almost entirely directed to wool growing, and manufactures and the Merino rose into supreme importance; so great was the interest excited, that a thousand, and fourteen hundred dollars a head were paid for them. Unfortunately, some of the later importations arrived in the worst possible condition, bringing with them those scourges of their race, the scab and the foot rot.

The Merino is a patient, docile animal, bearing much confinement without injury to health; accurate experiments have shown that it requires a little over two pounds of hay per day in winter, while the Leicester will consume nearly four.

The Merino is a far better breeder than other fine-woolled sheep, and it is said that the lambs when dropped are hardier than the Leicester; the fleece is fine, though small, the average being in this State, only three pounds and two ounces, though some flocks shear four pounds. The French and Silesian Merinos, originally of Spanish stock, have been bred with much care in France and Silesia, where they were imported about a hundred years ago, and became quite separate and distinct in their characteristics. They were imported to this country by George Campbell and others, of Westminster, Vermont, in 1851. They do not, however, seem likely to supersede the Spanish.

SAXONIES.

The next importation of fine wools was of the Saxonies, a breed originally from the Spanish, but introduced into that State by the Elector of Saxony, and being bred and treated with the utmost care, became in the quality of wool superior even to the Spanish Merino. It was believed that sheep produced so far north as Saxony, although discarded from the Spanish Merino, would prove hardier and more suitable for our climate; but results have not justified the expectations of those who introduced them, which at the time were raised to a degree nearly equaling those of the Merino. Samuel Henshaw, of Boston, imported the first in 1823. A Boston house soon after imported several lots, some of which were sold at auction, bringing as high a price as $450. Not giving the satisfaction expected by those who purchased them, they were soon crossed with the Merinos to such an extent that very few remain pure in this State. Although the Saxony wool is of superlative fineness, the sheep are not hardy, the fleece being so light as not sufficient to protect them from the cold and wet, or to be generally remunerative, averaging through the country only two pounds and two ounces to the fleece.

LEICESTERS.

Of the improved established breeds of England, the earliest, and the first imported into the country, was the New Leicester, so called from the county of Leicester, where it had its origin. It was formed by Mr. Robert Bakewell, of Dishley, whence it is likewise called the Bakewell or Dishley breed. It was about the year 1755 that Mr. Bakewell commenced those experiments in breeding sheep and other animals, which led to such important results; his object was to produce sheep exempt from the defects of the races then cultivated, and possessed of a greater aptitude to fatten and to arrive at early maturity, and the means which he employed were breeding from the individuals possessed of the properties sought for, and rendering those properties permanent in their offspring. It is known that by a continued selection of the male and female parents in a given number of animals, the points regarded as defects, can, under certain limits, be removed, and the acquired properties rendered permanent in the progeny by continued reproduction with one another. Holding bulk of body, and the produce of the fleece to be secondary properties, Bakewell directed especial attention to the external form which indicated the property of yielding the largest quantity of muscle and fat with the least bone, and what is usually termed offal.

The actual sources whence Mr. Bakewell derived his breed, cannot be accurately ascertained; it is probable that he was not particular as to the source, so that he could obtain the desired qualifications. He himself was very uncommunicative on this point, and the knowledge of the origin of his breed perished with him; it is even unknown whether, and to what extent he was benefited by the previous improvements of others, though it is very reasonable to presume that he did so as much as possible. It is probable, however, that the foundation of his breed was the best existing specimens of the "Old Leicester" breed, though in one of his letters to a Mr. Chaplin, a rival breeder in 1778, he admits at one time having made use of rams of the "Old Lincoln" breed. Progressively perfecting his animals by skilful selections, he necessarily continued to breed from his own stock, and did not scruple to connect animals the nearest allied to each other. This system continually pursued, not only gave a permanency to the characters imprinted on his sheep, constituting a breed in the proper sense of the term, but tended to produce that delicacy of form, which experience shows to be connected with the power of secreting fat, and arriving at early maturity. This system acted upon for successive generations, tended likewise to render the animals more the creatures of an artificial condition, more delicate in temperament as well as in form, less prolific of lambs, less capable of supplying milk to their offspring, and greatly reducing the weight and quality of the fleece. It was not that Mr. Bakewell was unobservant of these facts, but he appears to have regarded them as being of a consideration secondary to the property of producing in the shortest time, the largest quantity of fat with the least consumption of food.

That this was the main result at which his practice arrived is evident, and his success corresponded with his skill and perseverance; not only did he regard the growth of wool as a secondary object, but he appears to have entertained the opinion that the production of a large quantity of wool was inconsistent with the property of yielding much fat, and this opinion would necessarily conduct him to the choice of animals which produced a lighter fleece; indeed he is reported to have said that he did n't care whether his sheep bore any wool at all, or not.

Of course as he was alone, and could not, and would not improve his flock by crossing with others, he continued to "breed in and in," as it is called, to an extent never before practised, and the result was, that while he got very perfect forms and very fine bone, he greatly reduced the value of the wool and very seriously impaired the constitutions of his breed. Although most, if not all of the Leicesters of this State are from Canada, where they have been improved by crossing with the Cotswold, Cheviot and other breeds, becoming hardier, better woolled and more prolific, yet they have never proved favorites with any large portion of our farmers. Our long, cold winters, not less than our dry, scorching summers, when it is often difficult to obtain the rich, green feed in which the Leicester delights, and the general want of green food in the winter, rob it of its early maturity and even of the ultimate size which it attains in England. They are less hardy and more subject to disease than most other breeds; they produce fewer lambs, and these are more delicate and feeble, finding but an indifferent supply of milk.

Their mutton is too fat, and the fat and lean too little intermixed to suit American tastes; the fat lies mostly on the outside with but comparatively little inside; the South Downs, whose meat commands a penny a pound more than the Leicester in England, has heavy inside tallow. The London butchers in exposing mutton, show the inside of the carcase of the Down sheep, but hang the Leicesters with the back out. The desirable characteristics of this breed are thus given by Mr. Youatt: "The head should be hornless, long, small, tapering towards the muzzle and projecting horizontally forward and perfectly white; the eyes prominent, but with a quiet expression; the ears thin, rather long and directed backwards; the neck full and broad where it proceeds from the chest; the breast broad and full; the shoulders broad and round; no rising in the withers or hollow behind the situation of these bones; the bones of the leg small, standing wide apart; the chest and barrel deep and round; the ribs forming a considerable arch from the spine; the carcase gradually diminishing in width towards the rump; the quarters long and full, and as with the fore legs, the muscles extending down to the hock; the thighs also wide and full; the legs of a moderate length; the pelt also moderately thin, but soft, elastic and covered with a good quantity of wool." The fleeces of the Leicesters average about seven and a half pounds, soft, but rather inferior, worth about twenty-six cents per pound. In the carcase, the weight of the hind and fore quarters approximates nearer than in most breeds; two year old wethers, weighing when fat, from twenty-five to thirty-five pounds per quarter. When these sheep were first introduced into Canada and from there into the States, we have no means of ascertaining; the first direct importation was about 1820, by the late Christopher Dunn, of Albany, and subsequently by Col. Powell, of Philadelphia.

SOUTH DOWNS.

While the Leicesters can only trace their origin about a hundred years, when they as it were, sprang into being, a different animal altogether from their predecessors, the South Down on the other hand, can trace a long line of pure descent from a period antecedent to William the Conqueror, and is unquestionably the purest and most unmixed breed in Great Britain. The Leicester was made from a few individual animals possessing the qualifications which the breeder thought desirable, but the South Downs have reached their present perfection by constant and unremitting attention to the purity and perfection of the original breed.

The improvement of the Downs has necessarily been slower in its progress, but it has been obtained without any sacrifice of the intrinsic and desirable qualities of the original breed. The original sheep of the South Downs of Sussex were of the smaller breeds, with light fore-quarters, narrow chests, long necks, and long, though not coarse limbs; their wool was short, fine and curling, although not equalling the fine-woolled breeds; they had dark faces and legs. The chief principle adopted in improving them has been to amend the defects of form, and in so doing, the improved breed has become smaller in bone, with greater disposition to fatten, an earlier maturity and heavier carcase, while still retaining their former hardihood and capability of doing well on scanty pasture. These essentials constitute the perfection of the breed; they can endure the vigor of the weather and preserve their flesh on pastures where a Leicester sheep would die. The ewes are prolific breeders and good nurses; they are quiet and docile in their disposition, and though industrious feeders, exhibit little disposition to rove. The meat of the South Downs is of a superior quality, always commanding a higher price in the English markets than any other; its early maturity and extreme aptitude to take on flesh, render it peculiarly valuable for this purpose. The lambs are fit for market at twelve weeks old, and wethers turned at two years old, weigh from eighty-five to one hundred and twenty-five pounds; they make more internal fat than others, and on this account are favorites with the butchers; the fineness and quality of the fleece was no doubt one of the original recommendations, but this has long since become a secondary consideration, as it must necessarily be, in sheep raised for their flesh; the average weight of South Down fleeces is called in England at three pounds, in this country it will reach four pounds of washed wool, which is always in good demand and fetches from thirty-two to thirty-seven cents when Merino sells for fifty cents.

The improvement of this most useful breed of sheep, which has now spread all over the world, commenced about 1780, and is due to Mr. John Ellman, the first and principal breeder who pursued his system of progressive change, with judgment, perseverance and zeal; and he must be regarded as one of the most skilful and successful breeders of England. He displayed none of the too narrow selfishness which it is to be regretted appeared in the proceedings of his distinguished cotemporary, Mr. Bakewell. He freely communicated the details of his valuable practice, and showed himself to be entirely exempt from illiberal prejudices. He did not carry any of his principles of breeding to an extreme; he sought for the properties of health and soundness of constitution as well as for external form, and facility of fattening, and therefore did not, like Bakewell, confine himself rigidly to the blood of his own stock, but resorted to others, that he might infuse fresh vigor into his flocks, and prevent them from becoming too delicate. His aim, in short, was the really useful, and though he reaped the due reward of his enterprise and skill, it was never obtained by acts of any kind of deception or useless ostentation.

The description of a perfect South Down sheep, as given by Mr. Ellman, may not be uninteresting:—

"The head small and hornless, the faces brown and gray, and neither too long or too short; the lips thin, and the space between the nose and eyes narrow, the under-jaw or chop fine and thin; the ears tolerably wide, and well covered with wool; the forehead, also, and the whole space between the ears well protected by it as a defence from the fly; the eye full and bright, but not prominent, the orbit of the eye not too projecting; the neck of a medium length, thin towards the head, but enlarging towards the shoulders, where it should be broad and high, and straight in its whole course above and below. The breast should be wide, deep, and projecting forward between the fore-legs, indicating a good constitution, and a disposition to thrive; corresponding with this, the shoulders should be on a level with the back, and not too wide above; they should bow outwards from the top to the breast, indicating a springing rib, and leaving room for it; the ribs coming out horizontally from the spine, and extending far backward, and the last rib projecting more than the others; the back flat from the shoulder to the setting on of the tail; the loin broad and flat; the rump long and broad, and the tail set on high, and nearly on a level with the spine; the hips wide, and the space between them and the last rib on either side as narrow as possible, and the ribs generally presenting a circular form, like a barrel; the belly as straight as the back, the legs neither too long nor too short; the fore-legs straight from the breast to the foot, not bending in at the knee, and standing far apart both before and behind; the hocks having a direction rather outward, and the twist or the meeting of the thighs behind being particularly full; the bones fine, yet having no appearance of weakness; the belly well defended with wool, which comes down before and behind to the knee and the hock; the wool short, close, curled and fine."

A uniform brown or gray color of the face and legs is made an unvarying test by the best breeders of the purity of blood; a speckled or spotted face being unhesitatingly condemned as indicating an admixture of foreign blood.

COTSWOLDS.

The Cotswolds, which next claim our attention, take their name from a tract of low, chalky hills in the eastern division of the county of Gloucester, England, where they have been bred for a period of time running back beyond the reach of history. The earliest English writers mention them as being fed in great numbers "flocks of Cotteswolde sheepe, long-necked, and square of bulk and bone, whose wool being most fair and soft, is held in passing great esteeme amongst all nations." And Old Stowe, in his Chronicles, states that in the year 1464, "King Henry IVth granted license for certain Cotteswolde sheepe to be transported into the country of Spaine, which have there since mightily increased and multiplied to the Spanish profit, as it is said." At the same time, he negatives the idea advanced by some, that the Merinos of Spain took their origin from them; he says "true it is, that long ere this there were sheepe in Spaine, as may appear by a patent of King Henry IId granting to the weavers of London, that if any cloth were found to be made of Spanish wool, the mayor of London should see it burnt."

The Cotswold, soon after the New Leicester breed had been perfected, began to be extensively crossed with it. The attempt to improve by crossing Cotswold rams and Leicester ewes, failed of success, but crossing the other way proved eminently successful, and was pursued so extensively that there was hardly a Cotswold flock left which was not more or less mixed with the Leicester; the effect was in other cases to diminish the bulk of body of the existing breed, and to reduce the quantity of wool, and to communicate to the individuals a greater delicacy of form; about thirty-five years ago, however, the Cotswold breeders began to apprehend that their flocks were losing too much in carcase and fleece, and becoming less fitted for the climate of their native hills, and from that time they have preserved their blood in purity. In weight of wool, size, soundness and hardiness of constitution, they far excel the Leicesters. The sacrifice of the secondary properties, which Bakewell did not hesitate to make, is avoided, and the present feeling of breeders is to maintain a larger and more robust form to the animals. Thus, the Cotswold, though inferior in form to the New Leicester, is maintaining a successful rivalry with it in many parts of Great Britain, where a heavier fleece is preferred. Beside the qualities before stated, the Cotswold ewes are inclined to be prolific, often dropping twins, and are good nurses; their wool is strong, of a good color, rather coarse, but of a mellow quality, usually weighing seven or eight pounds; they make excellent mutton, and at two years old weigh from 25 to 35 pounds per quarter. A Cotswold ram has weighed 374 pounds, and sheared from 17 to 18 pounds. The Cotswolds may be thus described: they are large, the skin thick and covered with good coarse wool; the head long and rather thin, face and legs white, the ears wide, and not too thin, and not covered with wool, but having a tuft on the forehead, the wool comes down to the knee and hock, and covers the neck and chops; head well set on, back straight, deep brisket, and good barrel. They were first imported into this country about 1828 and since that time have been largely brought from Canada, many from the farm of Mr. F. W. Stone, of Guelph, Canada West, one of the most successful breeders of the Cotswold, South Down and New Leicester sheep, and short-horned cattle on this continent.

NEW OXFORDSHIRE, OR IMPROVED COTSWOLD.

In the county of Oxfordshire, England, they have for some years crossed the Leicester into the Cotswold, making a very large and handsome sheep, termed the. New Oxfordshire, or improved Cotswold. These sheep are large, with a very white, open fleece, of moderately fine wool; they are liked by those that own them; they resemble the New Leicester in appearance, though larger, and if they do not draw from that side the objectionable characteristics of the Leicester, will prove a profitable and desirable introduction; they should not be confounded with the Oxford Downs, which have dark faces and legs. Mr. Lawrence Smith, of Middlefield, who has bred them for over eight years, writes: "I doubt whether they are as hardy as the old-fashioned Cotswolds or South Downs. I have never had any trouble with them in regard to cold weather, or changes of climate; indeed, they prefer an open, cool, airy situation to any other, and nothing is more destructive to their health than tight ill-ventilated stables. My present experience warrants me in saying that one-half the ewes will have twins; they are capital nurses and milkers; I have not had for the past seven years a single case of neglect on the part of the dam, nor have I lost a single lamb from lack of constitution. Yearling ewes will weigh in store condition from 125 lbs. to 175 lbs.; fat wethers at three years old, from 175 lbs. to 250 lbs. My heaviest breeding ewe last winter weighed 211 lbs. My flock of store sheep and breeding ewes usually shear from five to seven pounds. My ram fleeces sometimes weigh ten pounds unwashed, and will sell in this condition for twenty-five cents per pound. I never feed my store sheep and lambs with grain, but give them early cut hay, and occasionally a few roots." These sheep were first imported by Mr. Charles Reybold, of Delaware, in 1846.

BLACK FACED HEATH BREED.

A few sheep of this breed, have been imported the past year by Sanford Howard, Esq., for Isaac Stickney, of Boston. As Mr. Howard is one of the best judges of stock in the State, it is presumed that these are good specimens. It is a very peculiar breed, inhabiting the barren and heathy hills extending all over Scotland, and the North of England, and is the most hardy of all the British sheep. They are not of large size, four year old wethers averaging only about fifteen pounds to the quarter; both sexes have horns; their faces and legs are black, limbs lengthy, and muscular, and the form robust; their wool is coarse and averages about three pounds to the fleece; their mutton is highly esteemed. An important property of this breed is its adaptability to a country of heaths and scanty herbage, in which respect it excels all others; it is this property as well as its hardiness that has rendered it so suitable to the heathy mountains where it is acclimated, and where it finds subsistence beyond the ordinary range of other sheep. The ewes are hardy nurses, and are able to bring up their young when they themselves have been exposed to great privations.

They have been successfully crossed with rams of both Leicester and South Down breeds. How they will succeed here, remains for their enterprising and public spirited owner to demonstrate.

HAMPSHIRE DOWNS.

It is said in England, that twenty years' careful cross-breeding and selecting is long enough to make a new and distinct breed of sheep; there are three such cross-breeds now recognized, so valuable for their meat and flesh combined as to be rapidly taking the lead in England; and the first of which we shall speak is the Hampshire Down, which originally was a large, white-faced, coarse sheep, with horns, and a moderate fleece of middle wool. About the beginning of the present century, the Hampshire breeders procured some rams of the South Down breed; finding the experiment successful, it was repeated again and again, always by selecting the coarsest and darkest faces of the South Downs; this was done till the whole character of the sheep was changed; the horns disappeared, the color of the face was changed from white to black, and with these changes they imparted a more compact form, a broader back, a rounder barrel, shorter legs, and superior quality altogether, yet preserving the hardiness and disposition to make early growth, which the original flock undoubtedly possessed. They have now spread all over England, and may be instanced as an example of successful cross-breeding; the lambs are large and fatten early, and this is a most important consideration in raising sheep for market. Mr. Spooner says, "the greater economy of fattening a young animal over an old one, may be readily explained by the fact, that whilst the latter increases in fat alone, the former does so in flesh, fat and bone, and thus can assimilate a greater amount of the nutritive properties of the food, and is consequently a more profitable feeder."

We know of but one lot of Hampshire Downs in this country, those owned by Mr. Messinger, of Long Island, and exhibited by him at the New York State Fair for 1860.

SHROPSHIRE DOWNS.

There has been, we believe, a small importation by Mr. Lorillard, of New York, of the Shropshire Downs; this breed is rapidly coming into notice and repute in England, they are essentially cross-bred, and made up from hardy mountain breeds through which they inherit an excellent constitution.

These Salop sheep were bred from the "Clun Forest," a short-legged, square-framed symmetrical sheep with dark-brown face and legs, and the Ryeland, a larger animal with white face and finer wool; these having been bred together, were again crossed with the Sussex, Hampshire, and South Downs, making the present breed of Shropshire, a large, symmetrical animal, bearing no resemblance to the original Shrop or Salop, except in the dark color of the face and legs. The Shropshire possess hardiness of constitution, an excellent quality of mutton, and are prolific breeders and good nurses; they have good shape and symmetry, well-formed, good dark-brown heads, deep chests, famous legs of mutton, with a good dock set high on a straight, long spine; the wool is of thick pile, and good length of staple, weighing from 5½ to 7 pounds per fleece. Wethers dress from 25 to 30 pounds per quarter. In a letter to the chairman of this Committee, Mr. Henry Smith, Jr., of Shiffnal, a celebrated breeder of Shrops, says: "for early maturity and weight of carcase and wool, with the least amount of food, I believe they are not to be surpassed by any breed, especially if their non-liability to disease, and fecundity, be duly taken into consideration."

OXFORD DOWNS.

Resembling these though perhaps in some points superior to them, are the Oxford Downs, formerly called the "Cotswold Downs;" but in 1857 a convention of the breeders of these sheep, holden at Oxford, decided upon giving them the name they now bear.

These too are cross-bred sheep, the cross having been commenced in 1833 by putting a Cotswold ram with Hampshire or sometimes South Down ewes, the Hampshire Downs being themselves cross-bred. By putting these crosses together, and by constant attention and breeding, a most successful result has been accomplished, producing a kind of sheep that possesses with uniformity of character, and hardiness of constitution, large frames, good fleeces, aptitude to fatten, and mutton of a superior quality. The people of this Commonwealth are indebted to Richard S. Fay, Esq., of Lynn, for this splendid breed of sheep.

Preparing to return to this country after a residence of some years in England, and with a thorough acquaintance with all the British breeds, he, with Hon. Wm. C. Rives, of Virginia, who also imported a flock for himself, selected this as the most desirable sheep, combining with the best meat-producing qualities a superior fleece of wool. Several lots were afterwards imported for David Sears, Jr., of Boston, and for himself.

The Oxford Downs have gray faces and legs, not quite so dark as the South Downs, head fine, and well set; small bone, deep brisket, round hams, good flat back; hips wide, and tail set up high; belly straight; buttock square, legs rather short and fine, and twist full; the loin is very wide and deep, and a wide spread between the hind legs for the development of the udder, indicates good milkers. They are exceedingly gentle, quiet and orderly, never jumping and not inclined to ramble; they are hearty feeders, and will thrive on any thing given to them, and bear better than any other large sheep, scanty pasturage. The ewes very commonly have twins and suckle them both; the lambs thrive very fast, often reaching 100 pounds in five months on nothing but milk and grass. A yearling ram from Mr. Fay's flock gained 15 pounds in three weeks, and a ram-lamb weighing 85 pounds at five months, or six months, weighed 105, on nothing but grass. A yearling ram seventeen months old, imported this season by Mr. Fay, weighed just off the ship, 250 pounds, and at twenty-one months old, 300 pounds; and a five-year-old ram of this breed weighed this spring, 360 pounds. Mr. Fay's ewes weigh from 150 to 180 pounds.

The fleeces are thick and heavy, and find a ready market, the wool being of a very desirable quality for certain fabrics. Mr. Fay's flock averaged over seven pounds of unwashed wool, for which he got thirty-four cents per pound. Mr. Druce, a celebrated English breeder, in a letter in the "Royal Agricultural Society's Journal," and Mr. Roberts a large breeder, say that their wethers usually go to market at thirteen or fourteen months old, dressing from 80 to 88 pounds, and shearing from 7 to 10 pounds. Their ewes weigh from 100 to 140 pounds; they are good mothers, and produce a large proportion of twins; they are seldom attacked by any disease. As a breed from which to raise early lambs, one of the most desirable and profitable branches of farming in this Commonwealth, this breed is unrivalled on account of the quick growth, early maturity, healthiness and thriftiness of the lambs.

As previously mentioned under the head of "native sheep," they make a most excellent cross for lambs on the old "English or Irish smuts" known so long here as native sheep. The quality of their mutton is unsurpassed, and they possess the rare merit of ripening early. Dark-faced sheep as a general rule, are the most desirable as being the most hardy, making the best nurses, ripening earliest and making from the least feed, not only the most but the best mutton.

CROSS-BREEDING.

The subject of cross-breeding has been with us a question of more than ordinary examination. It is a matter of regret, that so far as we are informed, there have never been any well-regulated or properly directed experiments in the cross-breeding of sheep in this Commonwealth; and so far as we know the attempts in this country to cross-breed systematically, establishing a fixity of character in the new-created breed, have been very few; it has been done by a few gentlemen in Maryland, and by some Kentucky breeders, with such success as to have given their sheep a great reputation. An intelligent understanding of the principles that control this is of such importance to the skilful breeder, that we have thought expedient to devote considerable space to them, and have made use of all the materials within our reach; the works of Mr. Spooner, Dr. Blacklock, Mr. Youatt, and the essays of Mr. Finlay Dun, Mr. Lawes, John Wilson, M. Malingié-Nouel, all eminent writers or breeders, are among the authorities we use and freely quote. Although perhaps in this country we have not the same advantages or necessities for cross-breeding as in England, yet without doubt our sheep might have been vastly improved by careful and judicious selections and breeding; but as a general thing our people will not devote the time, the skill, the patience necessary to change permanently the character of any of their domestic animals, nor have they attempted to breed with any well-determined purpose.

To quote from an essay of Mr. Spooner: "When equal advantages can be obtained by keeping a pure breed of sheep, such pure breed should undoubtedly be preferred, and though cross-breeding for the purposes of the butcher, is practised with advantage and success, yet no one should do so for the purpose of establishing a new breed, unless he has clear and well-defined views of the object he wishes to accomplish, and has duely studied the principles on which it can be carried out, and is determined to bestow for the space of half a life-time his constant and unremitting attention to the discovery and removal of defects." Perhaps this is stated rather strongly, but in this impatient country of ours we seldom find a farmer who can and is willing to do this or any thing like it.

The true object of breeding sheep is the acquirement of the largest quantity of wool, mutton and tallow, of the best and most salable quality, but it must be guided by skill, judgment and experience, and must not be done at random. A great part of the whole art of breeding lies in the principle of judicious crossing, for it is only by attending properly to this that success can be attained, and animals produced that shall yield the greatest amount of profit for the food they consume. To carry out the system of crossing properly, certain animals must be kept pure of their kind, males especially; indeed, no animal possessing spurious blood, or an admixture with other breeds, should be used. The produce in almost all cases assimilates to the male parent in form, and in crossing sheep, the use of any rams not of full blood is injudicious, and ought to be avoided. In crossing, we must consider the influence of the individual parents on the progeny; the size of the animals, their habits and dispositions, and their peculiarities in regard to the time of their maturity; their fecundity and capability for rearing twins, their fleeces and fattening qualities. Far too little attention is paid at the commencement of an undertaking in these important matters.

Farmers enter upon this most arduous part of their profession with less skill and less perseverance than they would bestow in any other branch of business, and proceed to breeding and crossing without the knowledge of the first fundamental principle that should control it. In crossing, there are several important things to be attended to. Well-formed parents ought to be selected, if for the improvement of the wool solely,—of the Merino breed; if for enlargement and proportion of the carcass,—of the Downs or the Cotswolds; the size of the parents should not be too much disproportioned at first, "Nature abhors sudden extremes," and does every thing in the most gradual manner, though in breeding for the shambles it is desirable to use a larger ram than otherwise, as it is now generally admitted that the progeny is more influenced in its external form and size by the male, and in its constitution by the female. This is strikingly illustrated by a breed of sheep well known in this Commonwealth fifty years ago, and still existing, called the "Otter breed," from the peculiarity of their legs; they originated on one of the islands in the eastern part of the State; a ewe of the "native breed" belonging to a man, dropped twin lambs, one of them a ram, which was allowed to grow and serve ewes; his offspring inherited the same peculiarity to such an extent as to create the breed thus described by Mr. Livingston, in 1811: "These sheep are long bodied rather than large, and weigh about fifteen pounds per quarter; their wool is of a medium fineness, and a medium length; but that which particularly characterizes these sheep is the length of their bodies and the shortness of their legs, which are also turned out in such a manner as to appear rickety. They cannot run or jump, and they even walk with some difficulty. They appear as if their legs had been broken and set by some awkward surgeon." These sheep owed entirely their peculiarity to this ram.

Mr. Spooner says: "The back, loins, hind-quarters, general shape, skin and size, follow one parent, and the fore-quarters, head, vital and nervous system the other, and we may go so far as to add that the former, in the great majority of cases, go with the male parent, and the latter with the female." While the male offspring generally takes more strongly of the characteristics of the father, and the female of the mother, yet the more powerful and vigorous parent, doubtless impresses on the progeny an undue influence of its character. While a large ram is used in breeding for the butcher, it is of importance that the ewe should be well spread, that the pelvis should be wide and capacious so that she may have no trouble in lambing. It is not to be imagined that when by dint of crossing we have attained the variety wanted, it will remain in the condition to which we have brought it without the slightest liability to alter. Many farmers believe they have done all that is required, if they subject their stock to three or four crossings. They think that the improved animals they have obtained, will support the acquired characters uninfluenced by extraneous agency. Now no idea could be more erroneous, nothing more faulty than this mode of management. Changes in fact by crossing are not to be effected in a short space of time; it will require years of constant exertion to alter a flock; the progeny of most domesticated animals often bear a striking resemblance to the grandfather or grandmother, and it is well known that the desired changes cannot be effected on a breed, or that the desired breed cannot be produced till the third, fourth, or even the fifth crossing, so that the importance of having few defects in a breeding stock will be readily admitted. The question of "breeding in and in," or from animals with near affinities, is somewhat an open one in England. We believe the inexpediency of it is universally acknowledged in this country, and our limits will not admit the arguments adduced by either side. On the part of those who favor the practice, it amounts to this, that they can make selections of more perfect animals from which to breed, by continuing in the same flock, but that it requires the nicest judgment to do it successfully, and not impair the constitution, or diminish some valuable quality, which the opponents to the system on the other hand, maintain must inevitably be the consequence of continuing the practice.

There is a direct pecuniary advantage in judicious cross-breeding; increased size, a disposition to fatten early, fecundity, and early maturity are thereby induced. Many farmers are contented with the first cross as possessing all these qualities, and sell all their lambs; the great objection to this course is that it makes the necessity of selling out each year, and buying in anew,—never renewing from one's own flock, but dependent on others, which is wrong in principle. This is sometimes done with the South Down and Merino, and very good lambs are procured, but they cannot be successfully continued in breeding; any attempt to engraft the South Down permanently on to the Merino will eventually fail; there is not sufficient affinity of constitution between the improvers, and those we wish to improve. If two animals very different in their qualities are put together, the offspring may resemble either one parent, or the other, and the faults of either, or of both may appear in the second or third generation; the more closely the natures of different animals approach each other, the more likely is the offspring they produce to be according to our wishes, for nature does not delight in contrasts. The Merino cannot be made to amalgamate with the coarse-woolled sheep. It has been repeatedly tried in England under royal patronage and the most favorable auspices. Undoubtedly if the carcass of the South Down, and the wool of the Merino, could be united in the same animal, the acme of sheep-breeding would be attained. It was found, however, that the quality of the wool was not a sufficient recompense for the want of early maturity and feeding properties, and at length, after many trials, the Merinos disappeared, and although there are a few left in England, all attempts at crossing with them have long since been given up.

In France a distinguished farmer and agricultural writer, M. Malingié-Nouel, after having tried in vain for years to cross the coarse-woolled sheep of England, on to the pure Merino, succeeded by taking mongrel Merinos from different provinces and crossing them together, till he had broken up the controlling influence of the ancient Merino blood. He says: "Breeders attach the greatest importance to purity of race on each side, because of the natural law by which the offspring resemble not merely the father and mother, but sometimes the grandparents, the great-grandparents, and further still. The purer the race of such ancestors, the more strongly do its characteristics overcome the subsequent mixture of breeds, and imprint themselves on the new offspring; in fact the principle of antiquity or purity of race, is what has most influence upon crosses, and we see it in the Merino and South Down sheep, and in the Hereford and Devon cattle; old races, as contrasted with the Short-horns and the Ayrshires, mixed breeds. The most successful cross-breeding in England, according to Mr. Spooner, has been of the Oxford Downs, made by crossing the Hampshire Downs, the Cotswold and the South Downs together. He publishes a statement by Mr. Druce, one of the first to introduce this cross, who says: "I find no difficulty in keeping the form and size of the animal as it should be, the wool of a valuable quality, and not deficient in quantity, and I maintain that the good qualities can be better secured by employing the cross-bred animals on both sides, than by using the first cross." He also gives a table of experiments in feeding, showing that the Oxford Downs far surpassed the Cotswolds, Leicesters, Hampshire Downs, and South Downs, in the superior quality and higher price per pound of the mutton, as compared with long-woolled sheep, and the superior weight of wool and mutton as compared with the short-woolled.

These principles of judicious cross-breeding are of immense importance to us, applicable to cattle as well as sheep. Large importations of splendid cattle, and sheep have been constantly made by enterprising farmers and breeders, because it was easier to buy, than to make such stock. But without unremitting care in breeding, our stock will deteriorate,—or we shall be obliged forever to have recourse to England to keep it good, either of which courses would be discreditable to us. Skilful cross-breeding also necessitates an improvement in the management, as well as the breed, for it is a mistake to improve the flock without changing the management, and an equal mistake to improve the management without refining the breed; both should advance together, if profit be looked for.

SUMMER TREATMENT.

The management of coarse, or middle-woolled sheep, both in summer and winter, differs somewhat from that of the fine-woolled, and as for reasons before given, we regard the raising of sheep for mutton and lamb, as of vastly more consequence to the majority of the farmers of the Commonwealth, than growing them solely for their wool, we shall in these remarks refer mainly to the meat-producing sheep, such as every farmer should own, in number according to his condition, from five to fifty. In such flocks, we gather from the returns, the ewes usually drop their lambs before going to pasture, because they are easier attended, can be better cared for, and the lambs are much safer. As a Berkshire farmer says, he would rather see his "lambs all safe in the yard, than to run round the pasture and pick after the crows and foxes."

With the majority of those whose principal sheep husbandry consists of that most profitable branch of agricultural occupation, raising lambs for market; the lambs having been dropped in February, March, and fore part of April, (of which we shall speak further under the head of Winter Treatment,) do not all go to grass, many being sold from milk and meal early, the others go with the ewes to pasture, and are taken away in June and July. There is a difference of opinion among the best farmers, whether it is the most profitable course to have the lambs dropped in February, to feed them wholly with meal and hay, and sell them never having eaten grass; or to have them dropped later, and giving no meal, letting them to pasture with the ewes, sell them later at a much lower rate. The first lambs dropped and fed with meal sell from $4 to $6.50 each, and are fit to go to market from the first to the middle of May. Five dollars each is a ruling price for first-rate lambs for some weeks, and then they decline, till finally the grass-fed lambs of July fetch only $2 or $2.50. The cost of the meal to the lambs being the only objection to the first course, the advantages gained are several. In the first place the price obtained for the early fed lambs, is considerably more than the extra keeping added to the price of the late lambs. A dollar's worth of meal is all the additional feed except the trifle of hay, which for a twelve weeks' lamb would be very small. The manure from the high fed lambs would be quite an item. Coming early, at a season when farmers are not crowded with work, and that, mostly about the house and barn, the ewes and lambs would be more closely watched, and the proportion of loss much less; then the twin lambs, of which there should be two-thirds, and their dams could be kept better and with more uniformity. And finally, the money received for the lambs, comes just when the farmer wants it, and when he has nothing else to convert into money so easily and profitably.

Before turning to pasture, the operation of "tagging," or "clatting," so called in England, should be performed. Sheep, on going out from dry to green feed are very apt to scour, and the long locks of wool on their tails and beneath them, become matted up and very filthy, interfering with the health and comfort of the sheep. To prevent this, the straggling locks likely to be fouled should be carefully clipped away.

It is frequently the case, that on first turning out the flock, some of the finest and healthiest lambs, full of health and play, will be soon after found dead, without any apparent cause. An intelligent farmer of Berkshire County, who had suffered in that way, suspected that the lambs becoming heated by play, laid down upon the cold, damp ground and became paralyzed; since that, his practice has been to turn them out at first only for a short time, and then returning, they lie down on the litter made under the sheds, and he has never since lost any. In turning sheep to pasture, perhaps the first thing is to see that the fences are secure; poor fences or walls will soon teach sheep to jump and ramble. One jumping sheep will lead a flock anywhere, and there is no remedy for the habit once acquired, but death to the sheep, or unreasonably high fences. A flock may by care, be kept within bounds, and hardly allowed to know that they can jump; the larger breeds of sheep are more quiet than smaller ones, and less liable to ramble. Every humane man who has seen the anxiety of sheep to escape the burning midday sun, will see that his flocks have shade of some kind; and if the pasture is deficient in this, will provide an artificial shelter.

Sheep ought to be supplied with water in a pasture, for although they will live without it, the fact that they will drink when they are allowed, shows that they require it, and we are decidedly of the opinion that no pasture should be unwatered.

Salt is indispensable for the health and thriftiness of a flock, and should be given in quantities varying from two to four quarts to the hundred sheep, once a week, increasing as the season advances. It stimulates the appetite, materially assists the digestion of food, and tends generally to prevent disease and to promote the health; it is fed on flat stones or more properly in troughs.

The use of tar applied to the noses of sheep is recommended, and it is often put into the troughs where salt is given, that they may smear their noses with it; many believe that the smell of the tar is of itself healthy, and a preventive of, and remedy for colds, catarrh and lung diseases, but as a protection against the fly that in July and August deposits in the nostril of the sheep, the egg producing the grub, which ascends into the head, it is invaluable; the smell of the tar is repulsive to all insects, and a free application of it is most effectual.

Sheep are usually shorn in this Commonwealth from the fifth to the twentieth of June, having been washed from five to fifteen days previously. The limits of this report will not admit of our going into the details of these operations and we must leave them, regretting that there are so few men who shear well, so few girls who spin well, and so few women who weave at all.

The period of gestation of ewes, as before stated, is from one hundred and forty-four to one hundred and fifty-two days; the time at which they will receive the ram, depends somewhat on the time at which the lambs were taken away, and also somewhat on their condition; it is a common remark that they will receive the ram about the time of the first frosts, in the last of August or the first of September. The time when they will be put together, will be controlled by each farmer's views as to the time when he prefers to have his lambs dropped. For the early market lambs, September and October will be the proper time, but for the fine-woolled lambs, or any others which are to be kept, November and the early part of December will do, so that the lambs shall be dropped when the ewes can have good pasturage and a full flow of milk. Where the lambs are to be kept up and fed with meal, and additional food can also be given to the ewes if necessary, there is no question as to the desirability of having twins dropped, and one point in making or selecting a flock, should be to get twin-bearing and good milking ewes; breadth and depth of loin and a wide spread between the hind legs, giving room for a large udder, are good signs of a milker. Mr. Youatt says: "If a farmer has pasture enough, and good enough, twins are highly desirable, for at only the usual expense before the yeaning time, the number of his lambs is doubled, and the pasture being good, and the lambs well fed, there will be very little difference in health, condition or value between the twins and the single lambs." The twins are generally obtained from ewes that are three, or four, or five years old. The disposition to twinning is undoubtedly hereditary; there are sometimes rams that have the credit of being twin-getters, and that faculty usually descends to their offspring, but this is oftener the case with regard to the ewe, agreeably to the old English couplet,

"Ewes yearly by twinning rich masters do make,
The lambs of such twinners for breeders go take."

The female of every species has far more to do with the unusual multiplication of the offspring than has the male; and the farmer who wishes to increase his stock through the medium of twins may go some ways toward the accomplishment of his object by placing his ewes on somewhat better pasture and allowing them a few turnips or other stimulating food, before the ram is let with them.

Mr. James Bird, of Berwickshire, in Scotland, in a prize essay, which received the gold medal of the Royal Agricultural Society, says: "To insure a large proportion of twins, the ewes have a short time before, and during the procreative season, a liberal supply of green food given them, such as rape or turnips; at one time the former was thought absolutely necessary, from its being believed to have a stimulating effect in their prolification; now, however, turnips, when given in sufficient quantities, are found practically to be equally efficacious. Either rape or turnips, experience has proved, assist more successfully towards the desired result, when given a week or so before the ram is let among the ewes. The sex may also be somewhat controlled, the animal at procreation being in the most vigorous and active condition, will be most likely to impress on the offspring its own sex. A ram will serve from forty to sixty ewes, according to his age and condition; if two years old, the first number is enough for him. A very convenient and important thing to do is to raddle the ram when let to the ewes, or smear his brisket with red ochre, or lampblack mixed with lard. Every ewe served is thus marked, and those which are not, may be supposed to be barren, and should be fattened. The age of a sheep is told by its teeth; from twelve to fifteen months old the two middle front teeth are shed, and their place is supplied by two broader teeth; two of the lamb teeth continue to be shed annually, and their places supplied with the permanent ones, till the sheep becomes, what is called full mouthed, at nearly five years of age, having the eight broad teeth.

A great and very general mistake among our farmers, is that of allowing sheep to remain out late in the fall, even till after snow covers the ground, without any additional food. After the middle of November the grass has been so repeatedly frozen and bleached out by the autumnal storms, that there is but very little nutriment left in it. The food that sheep eat goes to support life, to form fat and wool; they fill their bellies with this dry, worthless, dead grass; but there is nothing there to make fat or wool, which, when it stops growing, becomes dead at the root; when later in the season the farmer finds his sheep poor and losing, he gives them a more generous treatment, it goes to the formation of new wool, but not to the renewal of that fleece, which naturally comes off as spring advances. There is no animal so difficult to revive, and bring up to good condition, as a sheep which has been allowed to run down and grow poor.

WINTER TREATMENT.

We now come to the winter treatment of sheep, and the first requisite is to see that they have good and sufficient protection against the cold and storms of our New England winter; most of those who made returns to us, say that they keep their sheep in yards, with a comfortable shed to run into when they choose. Protection they must have to be kept in a thriving condition, and to keep flesh and wool growing. Experiments made by Lord Ducie, a few years ago, show positively, that even in the comparatively mild climate of England, with the thermometer at 44°, sheep kept under sheds consumed one-fifth less food than those in open fields, and produced one-third more meat, making a difference of nearly fifty per cent. Clear water is also necessary, all the better if running. Salt is also nearly as important, as during the summer months, to promote appetite and assist digestion, though it is said that a too free use of it to ewes with lamb, may produce abortion. The sheds and yards ought to be thoroughly and frequently littered. In feeding, one very essential element is, always to feed about the same time of day, at sunrise in the morning, at noon, and about an hour before dark, that they may eat and lie down. Sheep do not eat as well in the dark; during the short days of the winter the noon feed is often omitted. They should always be kept and fed separately by themselves, and not with cattle or any other stock; if fine-woolled, not over one hundred in one enclosure or yard; fifty would be better; if of the larger breeds, not over fifty. Too much care cannot be exercised in feeding ewes with lamb; they ought not to be fed very high, nor with very rich food just previous to parturition; there is danger of causing too large a flow of very rich milk, which seriously affects the lambs. A sheep eats from three to three and a-half per cent. of its weight a day of good hay; this would be reduced by the addition of half a pint to a pint of beans, grain, linseed meal, or the cotton-seed oil meal, for fatting sheep, and a gill for store sheep. Beans and cotton-seed oil meal are the best articles on which to feed sheep.

A change of food is very desirable for sheep, and the use of a few roots will be found most advantageous. We give part of a table compiled by some of the most eminent agricultural chemists and writers of Europe, showing the comparative value of different articles of food,—good meadow hay being taken as the standard.

100 pounds of good hay are equal to—

90 pounds of clover,
374 pounds of wheat straw,
442 pounds of rye straw,
195 pounds of oat straw,
339 pounds of mangold wurtzel,
504 pounds of turnips,
276 pounds of carrots,
59 pounds of oats,
45 pounds of beans,
45 pounds of pease,
50 pounds of Indian corn,
45 pounds of linseed meal,
45 pounds of cotton-seed meal.

This, however, shows only the relative value of these articles as food; another and most important item to the Massachusetts farmer, is the value of the manure made from these various articles of food.

Now we know the manure of different animals is of very different value,—and quite as much difference in fertilizing value is found to exist in the manure of each animal according to its food. In all the returns we have received, sheep manure is called much more valuable than common stable manure; the proportion is not exactly given, because none of our farmers have tried accurate experiments, and because its value is so varied by the litter, and other foreign substances composted with it. The tables of Boussingault and Poyen which are good authority, give 36 pounds of sheep manure as equal to 100 pounds of common farm-yard manure, and this we apprehend corresponds pretty nearly with the experience of our farmers. The tables of Mr. Lawes, an English agricultural chemist, farmer and writer, give the money value of the manure made from different articles of food, which we will not give in detail; showing that roots have small manurial value; hay has more; then Indian corn; beans, linseed meal, and cotton-seed meal, which has the highest value; a ton of it producing four times the value of manure that hay does: or in other words, as much as four tons of hay, worth from $50 to $60, while the Union Oil Company sell their cotton-seed meal at Providence, for $26.50 per ton, so that it must be great economy to use it; and we know farmers who have perceived very great gains in the value of the manure made from it; it is also superior to any other feed for producing fat, wool, and inducing a great flow of milk in ewes or cows. Linseed meal is so shamefully adulterated, that it can rarely be found pure, while the cotton-seed meal as yet unadulterated, is believed to be quite equal to pure linseed. The tables which we have given, although prepared with great care, may not be correct, or rather may not correspond with the opinions of, and results obtained by our own farmers, owing to differences in climate, habits of animals, method of feeding, and other causes, but they undoubtedly approximate to the truth, and are valuable if they only provoke criticism and actual experiments.

As the time approaches when the ewes will drop their lambs, they should be looked after with especial vigilance and patience; they should have good milk-producing food, like rowen hay, or a few roots at that time. Those which are just about lambing, should be removed for a while to some quiet place; if allowed to lamb in the sheds with the other sheep, the ewe is likely to be knocked about, the lambs to be run over, and separated from their dams, and when this happens, they are very apt to perish. If the lambs come in very cold weather, it is necessary to watch for them, pick them up immediately, carry them into the house, wipe them dry, and presently return them to the ewes. In that way we have no difficulty in saving every lamb. As a general thing, the ewes require no assistance in parturition; they sometimes refuse to recognize their young, but if held once or twice for the lambs to suckle, they generally make no farther trouble. The ewes and lambs should be kept separate for a few days from the remainder of the flock, and the ewe should have good food.

At two or three weeks, the lambs that are to go early to the butcher will begin to eat meal, and gradually increasing will at the end of four months eat nearly a quart a day. For such lambs it is common to have a separate pen under the shed, with a constant supply of meal for them, which they get at through an opening too small to admit the other sheep. Castration and docking are necessary operations, usually performed when the lambs are about a fortnight old, though some very skilful flockmasters prefer to wait two or three weeks longer. Docking is necessary as a matter of comfort and convenience to the sheep. At the time of performing these operations the lambs should be kept close in the yard; if turned out and allowed to play they will be likely to bleed.

Some care should be exercised upon the ewes at weaning, especially those from which the lambs are taken early, lest garget or inflammation of the udder should take place; they should be put on the poorest pasture or lightest feed for a few days, to check as much as possible the flow of milk. Some farmers are in the habit of driving off the lambs at once to a distance, and of occasionally milking those ewes which seem to suffer. Another way which we have tried successfully is to shut up the ewes in the barn, giving them simply hay, turning the lambs into good feed; after twelve hours we let in the lambs for a short time to suck; then separate them for twenty-four hours; and then allow them to suck for the last time; they are then separated beyond hearing, and both lambs and ewes do well. This part of a flockmaster's duty should secure much more attention than is common. The large, mutton-producing, twin-bearing sheep of England, have much more milk, and are more liable to suffer than the Merinos from neglect of the udder.

Our attention has been called in some of the returns to the thoughtless and cruel manner of catching sheep by the wool; the skin of the sheep starts readily, and if a sheep caught in that way, springing violently to escape, should be killed within a few hours, spots of clotted blood beneath the skin, would show where he was caught, and how strong his efforts to break away. They should be caught by the hind leg and neck;

the best way is to have a crook, or hook of about an inch and a half bend, on a hoe handle, catch this around one hind leg at the gambrel joint, and draw the leg from the ground, when the sheep on three legs become quite helpless, then seize the leg with the hand, and pass the other arm around the neck, in this way the animal can be easily, and securely handled; especially should this be the case in attempting to handle ewes heavy with lamb.

A few words on fatting sheep may not be out of place. Immense numbers of sheep are yearly brought from the north during the months of October and November into this State to be fattened; with no means of estimating any but the little county of Franklin, there are not less than 15,000 sheep fed there in the winter, all to go to market as soon as may be. While some practice feeding fat sheep four times a day, the general opinion seems to be that three times will do; grain is usually fed whole to sheep to save grinding, though the economy of it is questionable. Some feed a mixture of corn and oats ground together, linseed meal when they can get it pure, and cotton-seed meal which is always so.

Roots are very valuable to feed sheep, and beans. Some feed their sheep with grain, the first thing in the morning; but the better opinion is that midday is the proper time to feed roots and corn, good hay morning and night. In judging of the fatness of a sheep, beside handling the loin and brisket, a nice point is on the ribs between the breast bone and fore leg. Some depend on a full neck vein, but about as true a test as to the ripeness of a sheep, is the thickness of fur on the tail.

DISEASES OF SHEEP.

We are fortunately in this Commonwealth exempt from most of the worst diseases incident to sheep in England, and other portions of this country. While we do not propose to write a medical treatise, yet it seems proper that we should notice some of the more common ailments mentioned in the returns made to us. In speaking of the diseases of sheep, however, it is eminently the case that prevention is better than cure. Almost all the diseases to which our sheep are subject, may be prevented by proper housing from cold, storms and wet, by plenty of good feed, and by a judicious allowance of salt at all times.

Of all the domestic animals, sheep, it is well known, are the most delicate in their organization and constitution, and too often they lack the commonest care and attention. A little close observation of the condition and requirements of a flock, with prompt attention to the *prevention* of disease, would secure us an almost entire immunity. But if a farmer allows his sheep to be exposed on frost-bitten herbage, to the cold storms of November, he needn't be disappointed if they come in with a cold and a cough, or catarrh. If he keeps them all winter on dry hay alone, without roots or salt, he may expect stretches. If from that, he turns them out to rank feed in the spring, they will scour, but all these difficulties may be prevented.

CATARRH or COLD is very common at the fall of the year, particularly if the season has been very wet, or the flock much exposed to cold storms. Keeping sheep too close in ill-ventilated stables, will also produce that, and other diseases of the lungs. The membrane lining the chest, nostrils, throat and windpipe becomes inflamed, a considerable discharge of mucus takes place, and a cough is produced, from which the animal may recover of itself, and usually does with a little care, though the inflammation may extend to the lungs and prove fatal. The effect of a cold is at least to retard the improvement of the animal, and every severe case should be met with attention. Warm shelter and good nursing in mild cases, will usually effect a cure. If the symptoms are more severe, a mild dose of purgative medicine should be tried.

FOOT ROT is an exceedingly troublesome disease which prevails more or less wherever sheep are kept, though there is less complaint of it in our returns than we might have expected. While it is not generally fatal, by its irritation and the lameness it produces, it robs the animal of its flesh to the great injury of its owner. Whether or not the foot rot is contagious is still an unsettled question in England. Some of the most eminent agricultural writers and veterinary surgeons doubt it, among whom are Mr. Spooner, Dr. Blacklock, Mr. Read, and Prof. Dick. The prudent course, however, where it appears, would be to remove immediately every infected sheep from the flock, and not to allow any sheep to go on a pasture where such have been recently kept. The foot rot is only found on low or moist lands, and is supposed to arise from the hoof not wearing down as it does on stony ground, but growing through the warmth and moisture, to an unusual length. It exists to a greater or less extent in every situation that has a tendency to increase the growth of hoofs, without wearing them off. The treatment of this disease is uniform. The sheep should be taken after a rain, or having been driven through water to soften the hoofs, every part of the overgrown and diseased hoof should be pared away with a sharp knife; all the bloody, ulcerated, diseased portion of the foot carefully cleansed, and the feet dipped in a solution of blue vitriol and vinegar, hot; this proves a very effectual cure. This pestilent disease should not be confounded with "the fouls," to which sheep are sometimes subject, but which is not contagious. This is readily cured by a little solution of blue vitriol or spirits of turpentine, followed by a coating of warm tar. Perhaps the difference of opinion as to whether or not foot rot is contagious, may be accounted for by the fact that there seem to be two different diseases, arising from distinct causes, and discovering different symptoms.

In the very valuable essays written for the Royal Agricultural Society, the distinction is clearly drawn between the common "foot rot," and the "epizoötic foot rot," or murrain. The first is pronounced not contagious, the last is eminently so. Mr. Finley Dun, an English writer of acknowledged authority, says: "In the treatment of murrain the principle of non-intervention must be carefully recognized; palliative measures only are justifiable; all endeavors to arrest the disease, or prevent the eruption, are injurious. True, the clearing the foot from all filth, removing the superfluous or irritating horn, and placing the animals on good dry pasture, are in most cases all that is required until maturation, when much the same treatment is required as in common foot rot, bathing with acetate, or oxide of zinc, or solution of vitriol. Immediate and thorough isolation is imperative on the first discovery of this disease among a flock.

Grubs in the Head, according to Dr. Blacklock, are caused by the gadfly, which deposits its eggs during the summer and autumn in the nostril, causing great pain and irritation. They soon hatch, and the larvæ find their way up the interior of the nose to the front of the head, where they remain and grow till the following spring. To prevent the attacks of this mischievous insect, a thorough application of tar should be made to the noses of the sheep, at the beginning of July, and again at the first of August. As before mentioned, it may be done by smearing the troughs where salt is fed. Although neither Dr. Blacklock, Youatt, nor Spooner considers these as at all dangerous to sheep, remaining as they do in the nasal passage and frontal sinus, not in contact with the brain; yet as they cause considerable irritation to the animal, they should be removed. Tobacco smoke is an effectual remedy, and easily applied by taking a common pipe half filled with tobacco lighted, passing the stem well into the nostril, then folding a rag over the bowl to protect the lips, blow vigorously through it. Another remedy, pronounced thorough by an experienced flockmaster, is a strong decoction of tobacco injected up the nostril — this will destroy the grub, and cause the sheep to blow it out.

Poison. Sheep are often killed by eating the leaves of the low laurel, (*Kalmia angustifolia*,) sometimes called "lamb-kill;" perhaps it is not as generally known that the leaves of the mountain laurel, or "spoon-wood," (*Kalmia latifolia*,) are equally fatal. A farmer in Franklin County lost sixty from a flock of two hundred, this fall, which strayed from a good feed of after-math grass, into an adjoining pasture, to eat laurel and die. This plant, like other vegetable poisons of the same nature, probably produces a fermentation in the stomach of the sheep, which attempts to throw off the poison by vomiting. The animal becomes dull and stupid, swells a little, and is constantly gulping up a greenish fluid which it again swallows. In the early stages, if this greenish fluid be suffered to escape, the animal generally recovers. To effect this, gag the sheep by taking a stick six inches long and two inches thick, secure it in the animal's mouth by a string from each end tied over the head; the fluid will then as it comes from the stomach escape; a drench of milk and castor oil is also recommended. Lard made into pellets, and put down the throat, is said to be effective.

The Scab, a troublesome and nasty disease, is common to sheep all over the world; it is decidedly contagious, and is also induced or developed by filth, bad keeping, and by exposure to wet and cold weather. It is found to be caused by the acorus, a minute insect, which, burrowing in the skin, forms a pustule, which breaks, causing the "scab." The sheep infected with it are restless, scratching and rubbing themselves, and tearing off the wool. When closely examined the skin will be found to be red and rough with patches of scab, particularly on the shoulders and back. It is a most contagious disease, and if once introduced among a flock, the farmer may rest assured that unless the diseased sheep is immediately removed, every sheep in the flock will become infected. It seems to spread among the sheep not only by direct contact, but by means of rubbing places, and it has been proved, by a distinguished German naturalist, that the insect will live through a whole winter off from the sheep; and it often happens that when a farmer has got rid of his tainted flock, and covered his pastures with a new one, the disease has broken out again, and this has arisen from contact of the sheep with the old scratching places, such as fences, stones, or trees. An effectual remedy, and the cheapest and most convenient is tobacco. A preparation of tobacco, invented by George Jaques, and sold by Fisher & Company, of Boston, has been used by some of your committee, for ticks, and by other most reliable flockmasters, for the scab, and has proved so useful that we do not hesitate to recommend it; it is put up in nice packages of any quantity, all distinctly marked; it is of the consistence of tar, very strong; one pound of it, costing fifty cents, is diluted in twelve gallons of water, and the sheep either dipped in it, or it is turned upon their backs, and then squeezed from the wool into a tub; it is sure death to ticks, and is believed to be an effectual remedy for the scab.

SCOURS or DIARRHŒA frequently attack lambs, and sometimes full grown sheep; the causes are generally too sudden a change from dry to green food; salting too freely in the spring when the grass is young and flashy; commencing to feed grain in too large quantities; and exposure to sudden transitions of weather. Diarrhœa can be easily arrested by mixing a small quantity of pulverized alum in wheat bran, and feeding it a day or two.

STRETCHES is a disease which commonly occurs in flocks which are kept exclusively on hay or other dry food, and is very often fatal. The sheep affected with it will alternately lie down and rise up at brief intervals, and refuse every kind of food, frequently stretching itself, and manifesting signs of distress. It is now generally understood that it proceeds from costiveness, and may be prevented by an occasional feed of apples, potatoes, or other roots. Two table-spoonfuls of castor oil, or one ounce of epsom salts will prove an effectual remedy, if not too long neglected.

Ticks, when very numerous, greatly annoy and enfeeble sheep; after shearing, they leave the sheep for the long wool of the lambs, which should, in about a fortnight after shearing, be dipped in a preparation of tobacco before described, and which is perfectly fatal to the ticks. Sheep ought also to be examined when put up in the fall, and if infested with these vermin, to have a dip of tobacco. No doubt a little sulphur occasionally fed with meal or salt, will make a disagreeable stopping place for the ticks, without doing the sheep any harm. While we would again insist on prevention as necessary to the profit and comfort of the farmer, and to the health and safety of his flock, it is sometimes necessary to administer physic to sheep, and we quote from Mr. Spooner on that subject: "It is necessary that medicine should be given as a liquid, otherwise it would enter the rumen, (or paunch,) and remain there an indefinite time, producing an uncertain effect or perhaps none at all; it should be allowed to trickle slowly down the throat so as not to strangle the animal."

We have now, according to our ability, endeavored to discharge the duty assigned us by the Board, and perhaps have attempted more than was originally contemplated. We are quite aware that the preceding pages are open to criticism, but they have been prepared with some labor, and with the fullest appreciation of the importance of the subject to the farmers generally of Massachusetts, for whom they have been written, with the earnest hope that they will carefully examine the subject, and see whether with their common farms and limited ranges of pasture, the production of mutton and lamb is not one of the most profitable branches of the business of farming.

We have also that interest in, and fondness for the subject, which always attends familiarity with this most gentle, useful and profitable of our domestic animals; and we confess to a strong sympathy with that enthusiastic old English writer, who declares "the behavior of sheep as fascinating under any circumstances."

James S. Grennell,
S. H. Bushnell,
Cyrus Knox,
Committee.

Another subject of apparently increasing importance, demanding the most minute and careful investigation, is that embracing the diseases of the plants of the farm and the garden.

The committee appointed to conduct this investigation, presented the following

REPORT

ON THE DISEASES OF VEGETATION.

The Committee upon the Diseases of Vegetation would respectfully report that we have attended to the subject confided to us, and although laboring against the great difficulty, presented by the fact, that our field of observation is new, and furnishes no works of reference which can give much aid in our researches, we yet feel that something is being accomplished which will lead to valuable results as the investigation of the laws and causes of vegetable disease progresses. We believe, indeed, that the report upon the "potato disease," published in the Transactions of the Board, has so far satisfied the public mind as to have become the chief cause of the cessation of the conflicting and utterly unscientific newspaper articles, which previously to that report were published so numerously by the whole American press.

In reference to that disease, which has unfortunately been very prevalent in many places during the past season, we would say that we have examined it extensively, and find no reason, in any way to modify or contradict any of the statements of the committee who made the report alluded to. That different varieties of the potato show very different powers of resisting the disease, every farmer must have noticed, and it has been clearly manifested during the past year, that those kinds which most readily take on the disease are those which make the most rapid growth, and present soon after the appearance of the blossom buds, a disposition to cast off those buds without even an attempt to mature them, or when inflorescence takes place, it is not followed by the formation of capsules or balls. Among the varieties which we have carefully examined, we think the following list may be taken as showing the relative tendency to become diseased, those yielding most readily to the malady being placed first in order, and the most hardy being last. Chenango, Lincoln Seedling or Jenny Lind, Long Red, Seals Foot, Danvers Red, Black Chenango, Davis Seedling. We do not give this list as having any value beyond our own observation of a few varieties, as it would of course be very much modified by an increased number; but we have given it, as it may aid cultivators in determining what varieties it will be most prudent to cultivate or reject.

Disease has shown itself very extensively in many varieties of the Bean, in some cases so extensively as seriously to injure the crop and lesson its value. The pod, after being nearly at mature size, exhibits dark spots, usually over the inclosed kernel, and whenever this spot is seen, the bean beneath it, although often growing to full size, presents an appearance of having been frost bitten; and when these are numerous, as is often the case, the labor of removing them is so great as entirely to eat up all the profit of the crop. This diseased appearance commences invariably upon the outside of the pod, and gradually works its way inward to the kernel, and so far as we have made it the subject of particular investigation, would seem to be not unlike the potato disease in its general character. It appears to attack all varieties, whether early or late, bush or pole beans, and is worthy of a more extended and careful examination than we have yet been able to give it.

Our attention during the past year has been mainly directed to an examination of the disease of the apple tree, which was briefly described in our report of last year, and which we regret to say, is to be met with in all parts, if not in every orchard of the State.

The disease shows itself very commonly in this way. A vigorous tree is grafted by the usual process of cleft-grafting. For two successive years the scion makes a strong and healthy growth, but at the end of this period the bark around the stock where it was sawed off for the insertion of the scion is found to look as if stained with some black substance like ink poured over it, and often has shrunk away in some places from the wood, which looks as if charred in the fire. In two instances only out of the hundreds examined during the past year, like that above described, only two have recovered by the spontaneous efforts of nature. After the disease has shown itself in the manner described, its progress is very rapid in a downward direction, until it reaches the origin of the limb in which it originated, at where it usually, but not invariably ceases. During its progress nature makes constant efforts to effect a process of healing by which to arrest the disease, which notwithstanding, passes without any check over the barriers which she endeavors to erect in its course. Often the bark thickens to such an extent that the limb appears as if swollen, but uniformly has the burnt appearance so characteristic of the disease.

While speaking of this subject in connection with the process of grafting, it may be well to state that the disease has never shown itself, so far as we have examined it as a consequence of that method known as crown grafting, and if this fact should prove to be uniform, and to be confirmed by more extensive experience and observation, it will be valuable, and may bring this method of grafting into more general use. The effects which we have described often follow the trimming of trees by the saw, and this would have been considered under the same head with grafting, and as presenting a uniform cause, but for one consideration. In regard to grafting, we know, with comparative certainty, the period of the season at which the process was performed, while the trimming of an apple orchard is attended to at more irregular times, to suit the convenience of the operator, and if the season has any connection with the results of which we are speaking, it becomes important to determine whether the diseased spot was operated upon in the early spring, the autumn, or in winter. In examining this point, some results have been arrived at which it may be well to relate. Some orchardists have practised for years the trimming their orchards in the month of October, and others upon any pleasant day during the late autumn and winter. On trees thus treated *we have not yet found the disease*. Taking this fact in connection with that already alluded to in relation to crown grafting, which of necessity must be performed after the period at which, in the common parlance of the farmer, the bark begins to slip easily, we think if our observations are confirmed the time of trimming an orchard will assume great importance. It would appear that any serious bruising of the bark is sometimes followed by the disease, and of course if the wound is occasioned by the plough or cart-wheel upon the trunk of the tree, it must be much more serious in its results than when the access of the disease is in a small limb. We do not intend to offer any theory in regard to the manner in which the disease is brought about or what may be its precise nature. Careful observation shows plainly that the disease does not always commence in the same way, as in many instances the wood is first attacked, while in others it appears confined to the outer surface of the bark. It may be of interest to determine whether any particular varieties are peculiarly liable to suffer from the devastating influence of this scourge. We have not thus far been able to settle this question by facts sufficiently extensive to give reliable results, since varieties which in one locality are soon destroyed, in another manifest the greatest degree of vigor, and obstinate resistance to the influences which cause the diseased action. A single variety may be regarded as an exception, since all the cultivators who have tried it give their testimony so far as inquired of, to its uniform liability to a very destructive form of the disease under consideration.

This variety is the Sops-of-Wine, and it is well for the fruit-growers that this peculiar liability to decay does not belong to a more valuable variety of the apple. A theory prevails very commonly among orchardists that the disease in question is occasioned by the action of the sun during hot summer months, and many individuals have defied us to point out its existence except in situations having an exposed southern aspect, and in such cases we have always been able to indicate its presence upon portions of the trees where the sun could never have exerted any direct action. It is sufficient to overthrow this theory to state, that parts of the tree most protected from the sun's action are quite as liable to perish by the influence of this destroyer as are those brought in the most direct manner under the influence of his rays, and instances are not very uncommon in trees which have grown up wild in the dense forest.

We have thus noticed the chief points of interest upon this important subject, so far as we have at present investigated the subject, by no means pretending that future observation may not lead to modifications of opinion in reference to it, and urging upon all persons interested in such matters, to aid in forming correct ideas, well grounded upon facts in reference to the nature of the disease described, and the best method of dealing with it.

JOHN C. BARTLETT.
W. S. CLARK.

At the same meeting, the committee, in continuation of the subject as presented in the Report of last year, pp. 103–114, submitted the following

REPORT

ON ROOT CROPS.

Your Committee have found it necessary in order fully to consider *the economy* and *the necessity* of the root crop to the farmers of Massachusetts to present by comparative tables the commonly accepted facts as to the nutritive value of the various crops which are *generally* cultivated by our farmers. We have gathered from the sources of knowledge open to us many facts which seem to carry evidence of their importance to every observing mind, and which have been confirmed in our own experience or in the experience of farmers personally known to us.

Carrots, *Mangolds*, *Swede Turnips*. — Many of the statements in circulation of an immense yield of these crops, and of wonderful results in feeding the same are known to be unreliable. The *average* product and value of these crops must be taken if we would *prudently* consider the expediency of entering upon their cultivation.

Comparative value of the following crops as food for animals, elaborated from the tables of analysis by Boussingault and Fresenius, and of practical values. as obtained by experiments in feeding, according to Block, Petri, Meyer. Thaer, Pabst, Schwertz, Schweitzer. and John Brooks, of Princeton.

BY ANALYSIS IN 2,000 POUNDS.	Water in 2,000 lbs.	Nutritive equivalent by analysis, Hay considered as the standard.	Nutritive equivalent by average result in seven experiments in feeding, English hay as standard.	Money value by computations, made from the results before stated in feeding.			Experiment in feeding for a product in milk, by JOHN BROOKS.
				Hay $10 per ton.	Hay $15 per ton.	Hay $20 per ton.	Hay valued at $10 per ton.
English hay,	220	2,000	2,000	$10 00	$15 00	$20 00	–
Red clover hay,	201	1,500	1,900	10 50	15 75	21 00	–
Rye straw,	374	9,580	7,080	2 86	4 29	5 72	–
Oat straw,	420	7,660	4,400	4 41	6 61	8 82	$5 00
Swedish turnips,	1,820	13,520	5,240	3 80	5 70	7 60	–
White turnips,	–	19,380	–	–	–	–	2 40
Mangold wurtzel,	1,791	8,000	7,920	2 52	3 78	5 04	–
White beet,	1,712	13,380	–	–	–	–	–
Carrots,	1,741	100,46	5,660	3 88	5 32	7 76	3 60
Potatoes,	1,518	6,380	3,880	5 14	7 71	10 28	–
Indian corn,	360	1,100	1,100	18 18	27 27	36 36	Corn meal, $10
Buckwheat,	241	1,100	1,280	16 00	24 00	32 00	–
Barley,	262	1,300	1,040	19 20	28 80	38 40	–
Oats,	242	1,200	1,160	17 24	25 86	34 48	–
Rye,	221	1,160	980	20 40	30 60	40 40	–
Wheat,	201	1,100	860	20 42	30 63	40 84	–
Oil cake, (linseed,)	265	410	1,280	16 00	24 00	32 00	–
Oil cake, (cotton-seed,)	136	330	1,160	17 24	25 86	34 48	–
Beans,	158	460	900	22 20	33 30	44 40	–
Pease,	172	540	880	23 60	34 40	47 26	–

Root Crops as Food for Man. — Next to cereal crops as food for man, follow root crops. In variety and excellence of flavor, so comprehensive and universally excellent, meeting the wants of the appetite in all seasons of the year, and the conservator of health: in substance, gratifying and satisfying "the system." Root crops have become, at least to man, an indispensable need. The farinaceous vegetables are cultivated on a broader belt of earth than the cereals: their improvement in quality has kept pace with civilization. First in value for the support of the vital forces is the potato. The predominance of saccharine juice in the parsnip, carrot and beet, entitle these roots to a more general appreciation. The potato, originally "a sea shore plant," thriving best in a hilly, rocky soil, notwithstanding it has been multiplied into hundreds of varieties, (and planted in every variety of soils remote from the sea,) has not changed its essential farinaceous qualities. These changes have perhaps weakened the vigor of the root.

Cultivation. — The following mode of cultivation has been practiced with economy on Long Island :—

Manure the land, plough, harrow, plough again with swivel plough, drop the seed (medium size or large potatoes cut lengthwise) twelve or fourteen inches apart — in the third furrow opened, and at the same time, sow plaster, ashes and salt, in the furrow. Cover six inches in ploughing the next furrow, and so continue until the field is planted over. When the potatoes break ground, harrow crosswise. Use the cultivator once or more as necessary. Follow the cultivator with the double mould board plough, thinning out the weeds and levelling up the earth about the stalks with a sickle hoe. In harvesting, (after pulling the tops) run through the rows with the potato digger plough. Store the crop as soon as possible after it is taken from the ground. If the potatoes show signs of decay it is very doubtful whether any yet discovered misnamed specific will arrest the evil. Potatoes when properly stored in the manner stated for mangolds have been kept as safely as the mangolds through a long season.

Instinct may have been a sufficient guide for man, to induce him to learn the cultivation of the vegetable kingdom. But it is not the less important that his sense of their value and necessity to the race should *be quickened* by a knowledge of the chemical connection which exists between the vegetable and animal kingdoms. The marked adaptation of the living vegetable to the wants of the living animal, "is exhibited in the fact that the animal finds ready formed in the ripened plant *all* the most important substances of which his own body is composed." The gluten is the same in composition with the constituent of the muscle; the oil with the fat of the body; the phosphates go to the formation of bone; the starch and sugar afford the necessary element for the purposes of respiration. Farmers who have provided for their household Kohl Rabi turnips, (pleasant flavor similar to the boiled French chestnut) and cauliflower as well as cabbages, Jerusalem artichoke as well as potatoes, Salsify, (oyster plant,) Skirret, (sugar root,) scorzonera, (a delicate root palatable and nutritious,) as well as the parsnip, beets,—with other well known vegetables, (so commonly used in cities,) such farmers never fear the surprise of a neighbor's dropping into a vacant seat at their dinner tables. Of the eight hundred varieties of nutritive plants chiefly used as food by man, (see History of Plants, &c., by Dr. Funger,) our farmers cultivate but a *very few* of them.

Healthful Influences of Vegetables. — Dr. Chadwick, of London, the well known English calculator of cause and effect, in fixing the period of human life, says that the blood which is impelled through the system is constantly carrying off the decayed particles of the human organism at the rate of six to seven pounds daily — about three pounds of which is carbonic acid, and the remainder decomposed animal matter. The whole body is renewed on the average of once in about thirty days. We know that "doctors disagree," yet if one-half the quantity stated be true, — the farmer's first concern is his health, — it is almost his entire capital. Without a full measure of health and spirits he cannot have the strength and courage to front exhausting toil.

We would remind the readers of this report of the following truths, by many doubtless remembered, but by many more possibly forgotten.

All vegetable substances consist of two parts, one called the organic part, which burns away in the fire and which forms ninety to ninety-nine from out of every one hundred pounds, and one called the inorganic part, which does not burn away.

The organic part of plants consists of four elementary bodies, known by the names of carbon, hydrogen, oxygen and nitrogen. For the nature of which and confirmation of statements relating to agricultural chemistry see Johnston's Catechism of Agricultural Chemistry, with an Introduction by John P. Norton. The inorganic part of plants contains from eight to ten different substances, viz., potash, soda, lime, magnesia, oxide of iron, oxide of manganese, silica, chlorine, sulphuric acid or oil of vitriol and phosphoric acid, which for convenience may be divided into three classes, alkalies, acids and neutrals. All plants require constant supplies of food in order that they may live and grow, which supplies they obtain partly from the air and partly from the soil: organic food to support their organic part, which they take by their leaves from the air and by their roots from the soil. "Some leaves have as many as one hundred and seventy openings or mouths in a square inch." The leaf of a plant seems to have three offices, power of absorption, that of assisting in the chemical preparation of the sap or life of the plants and that of evaporating its water. Hence we find that plants which are well exposed to the sun's rays make the most rapid growth.

They obtain their inorganic food from the soil alone. A soil in which plants will grow consists also of an organic or combustible and of an inorganic or incombustible part. The organic is derived from the roots and stems of decayed plants and from the dung and remains of animals and insects of various kinds. A rich soil contains about one-twentieth of its weight in organic matter. This organic matter supplies the organic food which plants draw from the soil through their roots. It necessarily diminishes when the land is frequently ploughed and cropped and not *properly manured.* To keep up the supply of organic matter in the soil, see Johnston's Catechism of Agricultural Chemistry. The inorganic or earthy parts of the soil serve two purposes: First, "as a medium in which the roots can fix themselves so as to keep the plants in an upright position." Second, it supplies the plants with inorganic food. The inorganic part of the soil consists chiefly of sand, clay and lime; but contains small quantities of the *same substances* which exist in the ash or inorganic part of the plants. These substances are dissolved by the rain and spring waters and sucked up by the roots of the plants. See Johnston's Catechism of Agricultural Chemistry. The vegetable fixed to one spot has the mechanical impulse to seek the supply of food requisite for its development. Unless the food is found in the soil, or artificially supplied by us, the crop will be a failure; for, as plants are intended as food for animals, nature *has provided that they shall not obtain* their perfection without taking up a supply of the ingredients which serve *as food* for man and beast.

Composition of soils of different degrees of fertility, (Johnson's.)

	Fertility without Manure.	Fertility with Manure.	Barren.
Organic matter,	97	50	40
Silica, (in the sand and clay,)	648	833	78
Alumina in the clay,	57	51	91
Lime,	59	18	4
Magnesia,	8½	8	1
Oxide of iron,	61	30	81
Oxide of Manganese,	1	3	½
Potash,	2	trace.	trace.
Soda, } chiefly as common salt,	4	–	–
Chlorine, }	2	–	–
Sulphuric acid,	2	¾	–
Phosphoric acid,	4½	1¾	–
Carbonic acid combined with the lime and magnesia,	40	4½	–
Loss,	14	–	4½
	1,000	1,000	1,000

Says Johnson: "The soil of which the composition is given in the first column, has produced crops for sixty years without manure, and still contained a sensible quantity of all the substances required by plants. That in the second column produced good crops when regularly manured; it was in want of three or four substances only, which were given to it by the manure. The third was hopelessly barren; it was in want of many substances which ordinary manuring could not supply.

The materials which enter into the formation of roots, as before stated, must be found in the soil or artificially supplied; for it is also a fixed law of nature that the leaves and the roots shall perform their functions simultaneously—and it is also believed (the experiments hitherto made go to prove this declaration) that if one of the important ingredients of the plant be absent, the others, although they may be present in sufficient quantities, will not be used. As in animals, where the food taken into the stomach is digested and formed into bone, muscle, fat, hair, &c., so in the plant, the nutritive portions must be found in the earth (and the air) to be resolved into wood, bark, grain, or some other necessary part.

Disintegration of the Soil.—The usefulness of all the ingredients of plants originally found in the soil depends on their exposure. If they are in the interior of particles which fibrous roots cannot penetrate, they cannot be made use of until the particles are pulverized, and their constituents exposed, in order that they may be dissolved by the rains, and thus prepared to be sucked up. Professor Hitchcock has shown by survey and analysis of the soils of Massachusetts, that there are in different sections of the State, nearly barren soils having the same chemical composition (unpulverized) as some of the most fertile soils in our country. The fertile soils leave their particles *finely* pulverized, and in consequence yield enormous crops.

Use of Roots as Food for Animals.—We have shown in this report and by reference to the authorities named below, that animals, like plants, are made up of organic and inorganic matter. In order therefore, that they may be perfectly developed and meet the reasonable expectations of those who rear and feed them, *they must receive* as food all the materials required.

The carrot, which contains pectic acid, in its nature closely allied to the gums, is valuable for this reason above all others—the acid gelatinizes food in the stomach, and thus renders it more digestible. Gluten repairs the daily waste of the muscle or lean part of the body. The gluten of plants is exactly the same thing as the muscle of animals. For fattening, oil-cake, or Indian meal can be fed with roots and coarse hay, or straw, more profitably than in any other way. For product in milk, feed turnips freely in addition to other food. For improvement of quality in butter, feed carrots.

Gathering and Storing Roots.—Carrots should be gathered before hard frosts occur. They begin to decay very soon if frozen. Gather mangold wurtzel as soon as the tops begin to show the effect of cold. Ruta-bagas will continue to increase in size (if they have been well fed) until the frost wilts down the leaves. Gather all kinds in dry weather—leave in heaps two or three days to dry before storing. If the grower has not *dry* cellar room to store his roots in, they may be preserved as follows: "Dig a pit six feet wide, ten or fifteen feet long, and eighteen inches deep, pile the roots as steep and high as the base will carry and keep them; cover the heap with a layer of straw six inches thick, and follow with a covering of earth six inches deep, patting it down so that the rains shall not furrow it; set one or more tile ventilators loosely filled with straw; in covering the heap throw up the earth so as to leave a ditch around it about two feet from the base line, being sure to so construct it as to drain the water away; cover the heap with an additional six inches of earth as late as the season will allow. Heaps of roots, however stored, must be properly ventilated—vegetable matter is invariably decomposed by heat, hence the frequent loss invariably resulting from a want of care in storing them. Let them be kept at as low a temperature as possible, above freezing point. All growers of root crops know by dearly bought experience, that if the crop is not *properly manured* or *cultivated*, it is the *most costly crop* gathered on the farm.

If a farmer is unable to provide the requisite manures, or if he has not the time to cultivate the crop, and is unwilling to pay for the labor required, (the chief labor being required in the busiest season of the year,) he will suffer less pecuniarily, by getting along as best he can, without attempting to raise it.

The farmers of England are governed by reason and circumstances in the cultivation of carrots, mangolds, ruta-bagas, and white turnips, which do not bear directly upon the farmers of New England. The farmers of England yearly furnish the London market *alone* with the mutton of 1,500,000 sheep, and more than a quarter of a million of fatted oxen and calves, and pigs in proportion. The English market can always be supplied with grain from abroad, but it must be supplied by the home farmer with beef.

Besides this stern fact, the soil of England is in better tilth than ours. In consequence of the necessity for rearing and fattening so much stock in England, the lands are kept in a better condition than we are ready or able to keep ours. The climate of England also favors the economy of a root crop.

The turnip being there fed in part on the land to store cattle and sheep, at a saving of labor over us, the manure is thus left without cost or trouble where it is wanted. The turnip in England is the second crop in a season. It is also a coarse crop in every plan of rotation, and is, moreover, demanded by the land owner of the tenant. The English farmer cannot prudently feed his accustomed quantity of oil meal and *straw*, without recourse to roots. The writer is persuaded, from the attention which he has been called upon to give to the subject, that on most farms, as a staple crop, Indian corn will do more for the *farmer* of Massachusetts in the way of enabling him to make *both ends* of his farm accounts meet, than any other crop which can be as generally cultivated, except hay. How much food and what kind is most cheaply gained from a given quantity of land and labor, is the question which has not yet been answered. The farmers of Massachusetts must *share* the *cost* of doubt and the *loss* of delay in the answer. The writer is, however, decidedly of the opinion that root crops should claim a larger share of the attention of the farmers of the State.

Proposed Rule for Measuring Bushels, by J. H. YUMAN, *of Alabama.*

Take a rod $51\frac{63}{100}$ inches long, $1\frac{1}{4}$ inches wide, one-half inch thick: divide its length into four equal parts, numbering them with large plain figures as shown by the example. Divide each division into ten equal parts with smaller figures. The larger divisions will be the lineal dimensions of a cubic bushel, and the smaller ones tenths. To apply the rule, take the three dimensions—length, breadth, and depth, of the roots as stored in bushels and fractions—multiply them together, and the result will be in bushels and tenths of a bushel. The side indicating bushels may be divided into four equal parts as proposed above, and then each division also into four equal parts; which would denote fourths of a bushel. Example.—To make a box or bin to contain a given number of bushels, fix upon its length and width in bushels as per rule. Divide the number of bushels in its contents by the product of its desired length and width, and the result will be the length and depth. The other three sides of the rule might be divided into other measurements, as yards, feet and inches, and found very useful. Disappointments so frequently arise from miscalculations as to the quantity of manures to be realized from the stock kept, that we add the following:—

For every thousand pounds of hay, the average droppings will be about 2,400 pounds of solid manure, weighing fifty pounds to the cubic foot. We also copy the following table from Johnson, by which the farmer may evenly apply his manures to the land.

DISTANCE OF THE HEAPS.	Number of heaps in a load.									
	1	2	3	4	5	6	7	8	9	10
3 yards, . . .	538	269	179	134	108	90	77	67	60	54
3½ " . . .	395	168	132	99	79	66	56	49	44	39
4 " . . .	303	151	101	75	60	50	43	37	33	30
4½ " . . .	239	120	79	60	47	39	34	30	26	24
5 " . . .	194	97	64	48½	38	32	27	24	21	19
5½ " . . .	160	80	53	40	32	26	22	20	17	16
6 " . . .	131	67	45	33	27	22	19	17	15	13
6½ " . . .	115	57	38	28	23	19	16	14	12	11
7 " . . .	99	49	33	24	19	16	14	12	11	10
7½ " . . .	86	43	28	21	17	14	12	10	9	8
8 " . . .	75	37	25	19	15	12	10	9	8	7
8½ " . . .	67	33	22	16	13	11	9	8	7	6
9 " . . .	60	30	20	15	12	10	8	7	6	5
9½ " . . .	53	26	18	13	11	9	8	7	6	5
10 " . . .	48	24	16	12	10	8	7	6	5½	4¾

Example 1.—Required, the number of loads necessary to manure an acre of ground, diving each load into six heaps, and placing three at a distance of 4½ yards from each other? The answer by the table is 39.

Example 2.—A farmer has a field containing 5½ acres, over which he wishes to spread 82 loads of manure. Now 82 divided by 5½ gives 15 loads per acre, and by referring to the table it will be seen that the desired object will be accomplished by making 4 heaps of a load and placing them 9 yards apart, or by 9 heaps 6 yards apart, as may be most convenient.

Your Committee venture to make the following calculations:—

A. S. McKinstry, of Hampden County, raised corn the past season on three separate fields (soil ranging from a good valley loam to a sandy soil); average product, 45 bushels corn per acre; average cost per bushel, for ploughing the land, planting, and necessary cultivation, was 28 cents (labor of harvesting offset by value of soft corn and the stalks for feeding); add for converting some into meal, six cents per bushel, making one ton of corn meal cost $12.24. Raised one-half acre carrots. Product, 345 bushels; cost for labor, six cents per bushel; allow 500 bushels as the product of an acre on the average, (from the change of seasons); labor would be $8\frac{34}{100}$ cents per bushel, or (40 bushels to the ton) $3.34 per ton.

Cost of labor on a premium crop of Mangold Wurtzels, raised by William Birnie of Hampden County. Yield of 2½ acres, 95 tons; labor, $120.50; same cost of labor on the average crop, 25 tons, $1.93 per ton.

Taking hay as the basis of calculation in feeding, hay costing for labor stored in the barn, $3 per ton. Cost for labor of an equivalent in corn meal, 1,100 pounds, (being the average by the actual experiments made in feeding, see tables annexed.)

Proportion of labor to be charged to same, . .	$6 71
Charge the crop with two cords of manure to the acre over that buried in the soil of the grass-land, proportion at four dollars per cord, would be, . .	4 40
	$11 11

Carrots, 5,660 pounds (by experiments reported in tables annexed, equal to one ton of hay) at $3.34 per ton; add for extra manure, four cords, $16 per acre. Carrots, (500 bushels,) 12½ tons to acre, $1.21 per ton, making $4.55. 5,660 pounds, at $4.55 per ton, $12.86.

Mangold wurtzel, calculated in the same manner, 7,920 pounds equal to one ton hay. Labor, $1.93 per ton; manure, same allowance as for carrots, per acre, 61 cts. per ton, making $2.54 per ton. 7,920 pounds, at $2.54 per ton, $10.06.

Comparative profit of the same crop for market, allowing the value and condition of the land cultivated to be naturally the same.

One acre in hay, yield two tons; take the market value near cities, fifteen dollars per ton, ...	$30 00
Value of labor in securing and marketing same, .	8 00
Profit on one acre, ...	$22 00

One acre corn, yield 45 bushels; 2,520 lbs. at 1$\frac{1}{2}$ cts.,		$37 80
Labor, $15.30; manure, $8,	$23 30	
Marketing,	1 00	
Total,		24 30
Profit on one acre,		$13 50

One acre carrots, 12$\frac{1}{2}$ tons; value in cities, $12 per ton,		$150 00
Cost of labor, $41.70; marketing, $12.50,	$54 20	
Extra manure used up by the crop,	16 00	
Allow for fluctuation in demand and price, $3 per ton,	37 50	
		107 70
Profit on one acre,		$42 30

One acre mangold wurtzel, 25 tons; marketing at $5,	$125 00
Cost, calculated as above, $63.50; marketing, $25,	88 50
Profit on one acre,	$36 50

From the closest calculation and observation which it is *prudent to make*, it is evident that the farmer who lives *remote* from market, and who must convert the product of the dairy into butter and cheese, cannot afford to raise mangolds or carrots extensively.

In the vicinity of towns where milk can be sold without much labor, where hay finds a ready market at $15 per ton, and an equivalent in corn can be raised (including a charge for the manure) for $\$11\frac{11}{100}$, and an equivalent in mangold wurtzels can be raised (including the charge for manure) for $\$11\frac{10}{100}$, it is economy to feed sparingly of hay, (substitute oat straw cut while the grain is in the milk,) sell the surplus hay of the farm, and crowd the corn and root culture.

For important information upon the subject of this report, we refer the reader to United States' Reports on Agriculture, vol. 1849–50, pp. 231, 266; vol. 1851, pp. 62, 65, 66, 154; vol. 1854, pp. 92, 423; vol. 1855, pp. 155, 262; vol. 1856, pp. 8, 455, 492; vol. 1857; vol. 1858, pp. 45, 109; vol. 1859, pp. 103, 114, 136, 372, 373, 446, 449, 452; Ellsworth's American Swine Breeder; Waring, Elements of Agriculture; Milch Cows and Dairy Farming, by C. L. Flint, pp. 118, 122, 197, 199, 137, 396; Grasses and Forage Plants, by C. L. Flint, pp. 177, 217, 219, 220, 231, 235, 236.

GEORGE M. ATWATER.

The Committee appointed by the Board to consider the subject submitted the following

REPORT

ON HORSES.

Among the circulars distributed by this Board, in the Spring of 1859, for the purpose of obtaining from the intelligent farmers of the State, information upon a variety of topics of great importance in agriculture, was one upon horses, in which the following inquiries were proposed:

1. What has been the ratio of increase in the number of horses in your town compared with the census of 1850?
2. What breeds of horses are raised in your town, also imported into your town, and where from?
3. What breed do you consider as the best for all work? Name also the breed best for roadsters.
4. Name the average value of each class, when three years and seven years old.
5. Name the owners and number of breeding horses owned and kept in your town, and their pedigree.
6. What, in your experience, is the average life of horses, also of mares?
7. What months of the year do you pasture horses? What other food do you give them while pastured?
8. On what are they most advantageously fed when stabled? Name the cost per month of keeping horses in full working condition, estimating hay $15 per ton, oats 50 cents, and corn $1 per bushel, roots $12 per ton.
9. Will you state such facts concerning the history, breeding, and management of the horse in your region, or economy in the construction of stables; improvement and economy in making of harnesses; modes of shoeing, &c., which you consider of general interest?

At the meeting of the Board in January, 1860, it was found that but few replies to these questions had been received by the

Secretary, and the Committee requested permission to postpone their report until the next year, trusting that by personal observation and study, if not by circulars, they might procure some useful knowledge upon the interesting and important subject confided to them. In the hope that some other method of inquiry might induce persons, known to be engaged in breeding horses, or interested in the improvement of this kind of stock, to furnish the desired information, another circular was issued and sent by mail both to a large number of private individuals and to the secretaries of the various agricultural societies of the Commonwealth for distribution. In this circular the following questions were propounded :—

1. Please to state the name of any stallion, or stallions, used for breeding purposes in your vicinity; also, the pedigree, (when perfectly reliable,) the height, weight, age, color and speed; also, the number of mares covered during the season of 1859, the price of service, and the general character of the colts got previously; also, the names of the breeder and present owner.

2. What is the cost of rearing, in the best manner, a colt to the age of three and a half years, reckoning the loss of labor of the mare when unfit to work, and the value of grass, hay, oats and roots consumed by the colt?

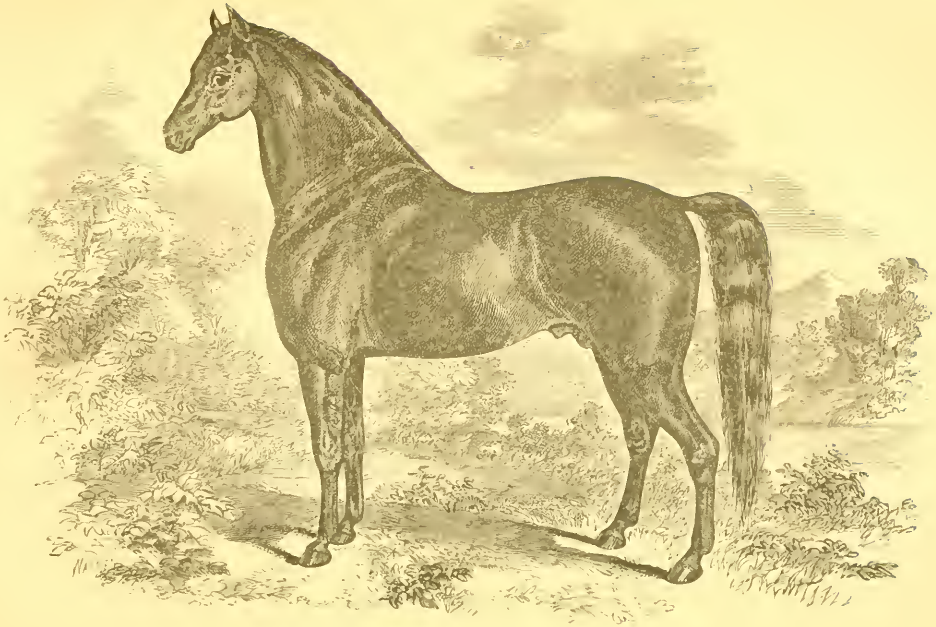
3. What breed of stallions will be most likely to get valuable roadsters when crossed upon the mares of your vicinity?

4. What breed of stallions are best adapted to produce horses for general farm purposes?

5. Considering the eminent success of breeders in Vermont during the last ten years, and the present high prices of first rate driving and draught horses, might not horses, in your opinion, be bred profitably by stock-growers generally in this State?

6. Inasmuch as the breed of cattle best suited for the dairy in the grazing districts of this State are commonly esteemed too light for draught, and those best adapted for fattening are sufficiently mature for market before they are old enough to work; and since many of the improved agricultural implements now in use require horse-power; and since horses work more rapidly and for a much greater number of years than oxen, would it not be more economical to employ, in most cases, horses, or mules, instead of oxen in the performance of farm labor?

The Committee are under obligations to the following gentlemen for replies to their inquiries, namely :—



THE ORIGINAL BLACK HAWK.

John Brooks, Jr., Princeton; William C. West, Chilmark; Salmon Capen, Windsor; F. A. Willard, Harvard; D. E. Merriam, Chelmsford; Silas Root, Westfield; S. F. Marsh, Sturbridge; M. R. Van Deusen, Alford; A. D. Briggs, Springfield.

Inasmuch as there was very little difference of opinion among those who answered the circulars upon the subjects discussed, it has been deemed expedient to embody their views with those of the Committee in the report now respectfully submitted.

REPORT ON HORSES.

General Daumas, of the French army, wrote to the celebrated Arab chieftain, Abd-el-Kadir, for information respecting the Arabian horse, and received the following account of his origin: "When God wished to create the horse, He said to the south wind, 'I wish to form a creature out of thee, be thou condensed,' and the wind was condensed. And God formed a chestnut horse, saying, 'I have called thee horse; I have created thee an Arab, and I have given thee a chestnut color. I have bound fortune on the mane which falls over thine eyes; thou shalt be the chief among animals; men shall follow thee whithersoever thou goest; good for the pursuit as for the retreat, thou shalt fly without wings; riches shall repose in thy loins and wealth shall be made by thy intercession.' Then he marked him with the sign of glory and of happiness, a star shining in the middle of his forehead. After the creation of Adam, God called him by name and said, 'Choose now between the horse and the borak.' Adam replied, 'The more beautiful of the two is the horse.' And God said, 'Excellent! thou hast chosen thy glory and the glory of thy sons; while they exist my blessing shall be with them, because I have not created any thing that can be more dear to me than man and the horse.'"

Never, perhaps, have the noblest qualities of the horse, his inestimable value to man, and the universal admiration in which he is held, been more eloquently expressed than in this beautiful specimen of Oriental style.

An English writer upon the natural history of the horse—Col. C. H. Smith—has given utterance to similar sentiments, in these words:—

"In the domestic horse we behold an animal equally strong and beautiful, endowed with great docility, and no less fire; with size and endurance joined to sobriety, speed, and patience; clean, companionable, emulous, even generous; forbearing, yet impetuous; with faculties susceptible of very considerable education, and perceptions which catch the spirit of man's intentions, lending his powers with the utmost readiness, and restraining them with equal willingness; saddled or in harness, laboring cheerfully; enjoying the sports of the field, and exulting in the tumult of battle; used by mankind in the most laudable and necessary operations, and often the unconscious instrument of the most sanguinary passions; applauded, cherished, then neglected, and ultimately abandoned to the keeping of bipeds who often show little superiority of reason, and much less of temper."

When and by whom the horse was first subjugated for the service of man is unknown, but it is certain that from the remotest times he has been the most useful and most highly prized of domesticated animals.

He was at first, doubtless, employed as he is even to the present day among many nations, exclusively for riding. In the account given in the Bible of the destruction of Pharaoh and his army in the Red Sea, is the earliest record of the harnessing of horses to vehicles of any description.

The ancient Egyptians, Greeks and Romans, gave much attention to the breeding of fine horses, and, as appears from their writings, and from antique paintings and statues they were by no means unsuccessful. Terrentius Varro, who lived more than nineteen hundred years ago, wrote the following excellent directions for selecting a good colt, showing that he, at least, had very correct notions upon the subject.

"We may prognosticate great things of a colt, if, when running in the pastures, he is ambitious to get before his companions; and, if in coming to a river he strives to be the first to plunge into it. His head should be small, his limbs clean and compact, his eyes bright and sparkling, his nostrils open and large, his ears placed near each other, his mane strong and full, his chest broad, his shoulders flat and sloping backward, his barrel round and compact, his loins broad and strong, his tail full and bushy, his legs straight and even, his knees broad and well-knit, his hoofs hard and tough, and his veins large and swelling all over his body."

In more modern times the Arabs have been the most careful and judicious breeders of the horse from about the year 1200 until near the beginning of the nineteenth century, and even now their beautiful steeds will compare very favorably with those of any other nation. At present almost every country in the world contains one or more breeds of horses exhibiting certain peculiarities of form, size, gait, temper and color, which are the result of their origin and treatment, and of the soil and climate where they are produced.

One of the most valuable qualities of the horse is his remarkable ability to conform to the circumstances of his situation. Wherever upon the earth man can dwell and furnish a supply of food, there the horse will live, and by his peculiar combination of speed and strength, render inestimable service. The reindeer wilts and perishes in the summer even of a temperate climate, while the ass, the camel and the elephant, are unable to endure severe cold, and are adapted for useful labor in warm countries only; but the horse is found in excellent condition both among the frozen snows of Iceland, and the burning sands of Africa.

Linnæus, in naming and classifying the animal kingdom, called the horse Equus Caballus, and the ass Equus Asinus. To the same genus belong the zebra, the quagga, and other living species, besides two fossil species, which seem to form the connecting link between the noble horse and his asinine congeners.

Whether the innumerable varieties of the horse have all descended from one original species, or whether there exists any where a race whose ancestors have always been untamed, it is, perhaps, impossible to determine.

Wild horses are found most abundantly upon the vast plains of northern Asia and the inland portions of South America, but exist also in many other sparsely populated regions. It is but little more than three centuries since the Spaniards brought the first horses to this continent, yet so rapidly have they increased, that immense numbers are now annually slaughtered for their hides only.

When Cortez landed his army upon the coast of Mexico, in the year 1519, he had with him sixteen horses, which were objects of wonderful curiosity to the simple minded Aztecs, who never dreamed of using any quadruped, either under the saddle or for draught. The strange and beautiful creatures were almost worshipped, and furnished with the softest couches for their repose, and a bountiful feast of roast turkey to satisfy their hunger.

Wild horses are generally of a reddish-brown, or a dun-color, with black manes and tails. They are of small size, rarely exceeding thirteen hands in height, or eight hundred pounds in weight, but are remarkably hardy, and often fleet, having been known to carry a man one hundred miles in eight hours.

The Tartars are said to make journeys of four hundred miles in three days without any considerable time for rest, feeding their horses only an occasional mouthful of grass. In such excursions each man employs three or four horses, changing from one to another as they become weary.

The habits of wild horses differ somewhat in different countries, though they are always gregarious, as many as ten thousand being often seen together. The herds are generally under the guidance of an old stallion, who has fought his way to the head in many a bloody conflict with his rivals, and whose superiority is acknowledged by his companions. The Tartar horses will sometimes attack and trample in pieces a strange horse unaccompanied by man; but in South America, where wild stallions are frequently caught with the lasso, and compelled to serve under the saddle, they are often liberated by their former associates, who gallop around the helpless travellers in the wildest confusion, producing such an excitement among the enslaved horses as renders them perfectly ungovernable. The action of such a herd has been thus graphically described:—

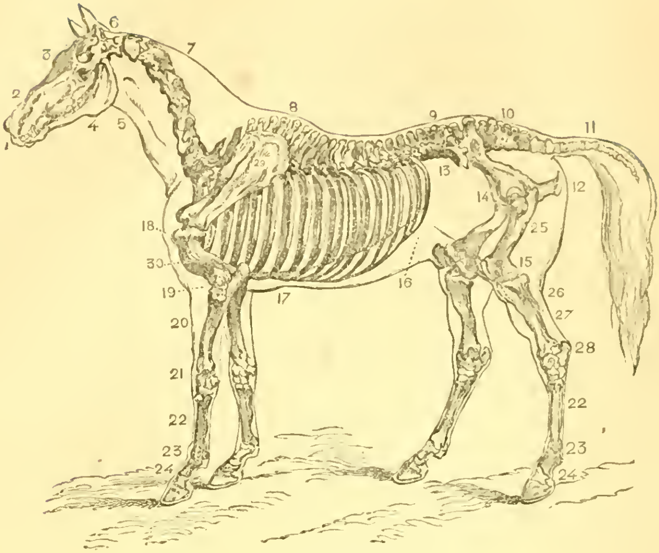
> "A trampling troop! I see them come,
> In one vast squadron they advance!
> I strove to cry—my lips were dumb.
> The steeds rush on in plunging pride,
> But where are they the reins who guide?
> A thousand horse and none to ride!
> With flowing tail and flying mane,
> Wide nostrils never stretched by pain—
> Mouths bloodless to the bit or rein,

And feet that iron never shod,
And flanks unscarred by spur or rod—
A thousand horse, the wild, the free,
Like waves that follow o'er the sea.
On came the troop—
They stop,—they start,—they snuff the air,
Gallop a moment here and there,
Approach, retire, wheel round and round,
Then plunging back with sudden bound;
They snort, they foam, neigh, swerve aside,
And backward to the forest fly."

The horse, in a state of domestication, is employed under the saddle for racing, for hunting; in war, for carrying burdens, or in riding upon business, or for pleasure; and in harness he is used for racing, for driving upon the road with light vehicles, or with heavier carriages, or, finally, for the performance of ordinary farm labor, or for slow draught.

In England, where the various classes of society are quite distinct and wealth abundant, horses have long been bred with special reference to each of the above-named uses, and consequently the varieties thus produced are there found in the highest perfection.

In order more intelligently to discuss the merits of the different breeds of horses, and the proper method of improving our own, let us first endeavor to become familiar with the characteristic points of the model roadster. By reference to the following engraving and explanations, the name and position of the important parts of the horse may be readily learned by those who are unacquainted with them:—



Points of Horse.

1. Muzzle.
2. Face.
3. Forehead.
4. Jowls.
5. Windpipe & Gullet.
6. Poll.
7. Crest.
8. Withers.
9. Loins.
10. Croup.
11. Dock.
12. Point of Buttock.
13. Point of Hip.
14. Hip Joint.
15. Stifle Joint.
16. Flank.
17. Girth.
18. Point of Shoulder.
19. Elbow-Joint.
20. Arm.
21. Knee.
22. Shank.
23. Fetlock.
24. Pastern.
25. Quarter.
26. Thigh.
27. Hamstring.
28. Hock.
29. Shoulder.
30. Humerus.

THE ROADSTER.

The perfect roadster should be from fourteen and a half to fifteen and a half hands in height, the hand being four inches, and the measure taken at the withers. When horses, as often happens, are considerably higher at the hips than at the withers, it is proper to take the mean of the measures at these two points as the height of the animal. Some horses rise so rapidly from the withers to the neck, that if the measure be taken in the usual way, a portion of the neck will be included in the height, which should be avoided by causing such horses to hold their heads to the ground at the time of measurement.

Horses less than fourteen and a half hands high are commonly pony-built and too small for general use. They are not often possessed of great speed from the shortness of their stride, although some exceptions have occurred especially among the Morgan horses.

Flora Temple, the fastest trotter ever known, is fourteen and a half hands high, and weighs about eight hundred pounds. Her stride when at full speed measures sixteen feet, an evidence of wonderful power in so small an animal. Her legs are so short and her muscles so perfect, that she gathers with almost lightning rapidity, and thus outstrips all her competitors. Her pedigree is uncertain.

Horses more than fifteen and a half hands high have usually less endurance than those which have not so much day-light under them. Long-legged horses are often spirited and fleet, and, as has been said, "will go in a day so far that they cannot return in a week."

The weight of the roadster should be from nine hundred and fifty to ten hundred and fifty pounds, though lighter horses are often very useful and heavier ones may be desirable for special objects. For fast work, however, one thousand pounds is sufficiently heavy, as the legs and feet of larger horses are very apt to fail.

The form of the head and the expression of the countenance are two of the most important points of a horse. The perfect roadster should have a long, lean, tapering head. Below the eyes as fine and delicate as is consistent with a large, open nostril; and above them as wide, high and full as possible, indicating a large brain and great intelligence. The face should be straight and the lips thin and firm, with a tolerably deep mouth. A convex face denotes generally an honest, rather sluggish, coarse animal, while a concave one is a pretty sure evidence of high temper and great spirit and not unfrequently of decided vice. It has been remarked that horses with faces either decidedly convex, or concave, rarely possessed good, open nostrils. The channel between the jowls should be wide and the windpipe large, free from fat and muscle, and somewhat detached from the neck. The eyes should be bright, large, not too prominent and showing but little white. The expression of the eye reveals the temper, spirit, and courage of a horse, with great accuracy. Horses with very prominent eyes fear every thing, and those showing much white around the eye are always to be feared. The ears should be thin, pointed, erect, lively, and not too far apart. A beautiful, expressive ear is rarely, if ever, seen on an indifferent horse.

The neck should be rather long and light, thin on the crest and well arched, while the under side should be straight and well and smoothly joined to the shoulders. A thick, fleshy crest is usually an indication of a lazy horse. The mane should be of moderate thickness and length, but not so heavy as to give the horse a coarse, clumsy, vulgar look. The length and thickness of the mane varies greatly in different breeds. The Arab and the English Thoroughbred have a short, thin, silky mane, while the famous Orloff trotters of Russia, are so remarkably furnished in this respect, that the mane if not trimmed, or tied up, would trail upon the ground. There is said to be in the Royal Museum at Dresden, the stuffed skin of one of these horses, which belonged to the last Saxon King of Poland, whose mane measures twenty-four feet in length, and the tail thirty feet.

The withers should extend well back and be rather high and thin.

With such a conformation of head, neck, and withers, a horse can hardly fail to be intelligent, courageous, spirited, light in the forehand and, if well-trained, possessed of a pleasant mouth.

The back of a stout, well-built horse, will be broad, nearly straight, and not too long between the withers and the hips, although it may be too short for the greatest speed or style. The loins and hips should be broad and well covered with muscle. The real power of a horse is greatly dependent upon the character of these parts.

The rump from the coupling of the hips to the insertion of the tail should be long, and somewhat sloping, and the tail properly set on, stout, straight, well-up and thickly covered with hair. It has been thought that a stiff dock, and bushy tail were reliable indications of strength and pluck, but it is certain that many a worthless horse has carried a splendid tail, and there have been many smart, tough, powerful horses with weak and almost naked docks. A good tail is however an essential appendage of a beautiful horse, so important indeed, that art sometimes supplies the deficiencies of nature. More than one man has bought a fine team and found to his disgust that the tail belonged to the harness and not to the horse.

The chest of a good roadster should be deep and full, but may be so broad as to give him a waddling gait. It is very important that the width be great just back of the fore-legs, and the larger a horse girths, the better. This affords ample room for the heart and lungs, his most indispensable organs.

The barrel, body, or middle piece of the roadster, should be of fair uniform size, as round as possible, and not too small, or tucked up, at the flanks. Sometimes, however, horses with the form of the greyhound have proved to be remarkably serviceable.

Mr. Darvill, an English writer on the race-horse, speaking of the form best adapted for great speed and endurance, remarks that the firm, contracted and yet projecting appearance of the anus, which should be well closed in by the surrounding parts, is one of the most reliable evidences of a strong and sound constitution ; and that a horse possessing this proof of good stamina, with broad hips, stout loins and spacious chest will always be a good feeder, with excellent wind, and able and ready to run, even though apparently deficient in carcass.

The last ribs should be long and tolerably close to the point of the hip, though, if very close, the horse will have less speed, but more endurance. Long-bodied horses are sometimes hollow, or sway-backed and are justly considered less capable of severe labor than those with short, straight backs. They are poorly adapted for carrying heavy burdens ; but a slight depression of back just behind the withers, corresponding with the arching neck, gives a more elegant and stylish figure and does not at all detract from the general usefulness of the animal.

The shoulder blade of the roadster should be broad, as oblique as possible, and extend well back at the withers, and the point of the shoulder should not be too low. The humerus which connects the shoulder with the fore-leg, although concealed within the abundant muscles of the part, is one of the stoutest and most important bones. It should be of good length and so joined to the shoulder blade as to slope rapidly towards the ground instead of running back under the body. The motion of the arm will thus be less confined and the fore-leg will stand in the best position. By this form the horse will be enabled to extend himself, or reach well, when going rapidly, and be less likely to stumble or to injure his feet or legs, than when he carries much weight before, or directly over, his forward extremities. The muscles attached to the arm bone are very numerous and important and can hardly be too large and firm.

A perfect form and sufficient power in the fore-quarter seem to be much more essential to the fast trotting than to the galloping horse. The latter moves by a succession of tremendous leaps made principally by the hind-quarters, while the fore legs appear to serve rather to support and steady, than to aid him in the progression. The square trotter needs a more symmetrical and evenly-balanced form, and throws himself forward almost as much with the fore as with the hind-quarter. The movement of the trotter, requiring the alternate extension of the fore legs, renders a broader and somewhat more muscular breast than is necessary in the racer, quite essential to the performance of much hard work.

The fore-arm, or upper part of the leg, should be as large, hard and strong as is consistent with good action. The knees should be broad, deep and firm, and composed of simple bone and sinew. The bone on the back of the knee should be prominent, and the shank, or lower part of the leg, should be rather short, wide, flat and free from flesh. It is important that it be not tied in, or too narrow immediately below the knee. Much has been said about the proper size of the shank bones and the joints above and below them. One declares the bone cannot be too small, and another that it cannot be too large, provided the limb be clean, dry and cordy. The advocate of fine bone affirms, with truth, that such bone is close grained, like ivory, and is strong enough, because it never breaks; while the other says, he knows from experience and observation, that a stout, durable horse must have rather large, substantial legs. Fine-boned horses are generally spirited, of good blood, and have a certain perfection of constitution. There can be no doubt, however, that large, well-developed joints are necessary to furnish a sufficient space for the firm attachment of the tendons, which cannot be too thick, hard or prominent, since they are always proportioned to the power of the muscles which operate upon them. If, therefore, the other points of the horse indicate a good constitution, and the form of his legs be correct, his shank bones will never prove to be of excessive size. If the shank be relatively short when compared with the length of the leg, the horse will have a low, long-reaching stride, and this form is favorable for speed and easy movement; but, if the shank bone be long, the horse will step higher and shorter and have more showy, prancing action.

The pasterns should be moderately long and sloping, since they are the springs provided to break the force of the concussion when the feet strike the ground. Many of our American horses have pasterns too short, upright and stiff, and are consequently soon ruined by fast driving.

The feet should be of smooth, firm horn, round, smallish, low and open at the heel, and with a large, elastic frog. The form and substance of the foot vary much in different breeds, so that a perfectly natural, and healthy and durable foot upon a horse of one kind may have the appearance of a badly diseased foot upon a different breed. Thus, a high-bred, nervous, fine-boned horse is very apt to have a small, upright hoof, with narrow heels and a shrivelled, hard frog, while a coarse, large-boned horse will have large, flat feet, low, and often tender heels, and an immense, soft frog.

The hind-quarter of the model roadster must be long from the point of the hip back to the buttock and down to the stifle, and heavily muscled both upon the outside and between the thighs. The stifle should be well forward, and the second thigh, or the leg just below the stifle, should be well furnished. The hocks should be low, broad, deep and bony, and not too crooked, because less elegant and more liable to strains. The point of the hock, as well as the point of the elbow on the fore leg, should be largely developed for the sake of the increased leverage thus afforded to the muscles acting upon them.

The four shank bones should be nearly perpendicular when the horse is standing still, and when he is moving at a moderate speed they should be carried straight forward without any swinging from side to side either of the feet or of the body. Horses remarkable for swiftness, either as trotters or gallopers, spread their hind legs when going rapidly, and some do so at an ordinary pace. This is an evidence of strength but has an awkward appearance, except where the hind feet are carried past the fore feet by the length of the stride, when the obvious utility of the motion renders it beautiful. It is important also to observe that the fore legs should be so joined to the body that the feet are neither turned in nor out; since either of these defects will prevent the free movement of the humerus, and almost compel the horse either to interfere, or to strike the inside of the shank, or knee.

The roadster should have a light, elastic step, rather short and quick and barely high enough to clear the inequalities of the road, as higher stepping horses waste much power and are more severely jarred when driven fast. He should pick up his feet nimbly, and move them as if he had them perfectly at his command, and should put them down at the right time and in a proper manner, neither holding them awkwardly poised in the air after the leg is fully extended, nor plunging his toes into the ground before he has reached forward a suitable distance.

It is much more desirable that the roadster, for general use, be able to travel ten or twelve miles an hour for two or three hours in succession, if necessary, than that he be capable of trotting a mile inside of three minutes. Very few of the fastest horses have a first-rate road gait, although the two qualities are not incompatible. It is unquestionably true, also, that horses with the best form and temperament for the highest flight of speed, especially in running, rarely possess the compact, substantial structure, or the calm, manageable, yet ambitious spirit essential to the model roadster. The impatient, reckless, headstrong disposition of the successful racer, even with the best management, which is always indispensable, is very liable to bring disaster upon both horse and driver when subjected to the severe trials of ordinary road service.

The skin of a well-bred horse will be thin and soft, and of a dark color; and the veins beneath it large and prominent, indicating a well-developed, circulatory system. In regard to the color of the hair the best and only universally applicable rule is, that "a good horse is always of a good color." Although color does not, necessarily, affect the usefulness of a horse, yet it does affect his appearance, so that a fashionable color greatly enhances his value. Color is, also, oftentimes the most obvious, though not the most reliable, proof of the pedigree of a horse.

It is well known that children of parents with dark hair and eyes sometimes have light, or sandy hair and blue eyes, and it is generally found that this peculiarity is derived from some ancestor two or three generations back. In the same way, horses may take their color from a grand-sire, or grand-dam, and this will frequently happen in those breeds which have not been long established. The celebrated stallion, Ethan Allen, affords an excellent illustration of this principle. The fact that he was sired by Black Hawk would, probably, never have been disputed, if he himself were black. Now, since his dam was gray, and his famous brother, Redleg, of the same color, with one bay leg, and his grand-sire, Sherman Morgan, chestnut, does the light color of Ethan or his stock furnish any good reason for disbelieving his well established pedigree?

Nearly all persons have certain fancies and prejudices respecting the colors of horses which are sometimes whimsical enough. For instance, we are told if a horse has

> One white foot, buy him;
> Two white feet, try him;
> Three white feet, deny him;
> Four white feet and a white nose,
> Strip off his hide and give him to the crows.

On the other hand, there is a tribe in northern Africa who have a special preference for white-faced, white-stockinged horses; and there are many persons in New England who consider a star in the forehead, or, at least, a white foot, quite indispensable to a fine horse. The English regard black horses as more viciously inclined than others, and esteem this a bad color except in draft horses. We, however, like Black Hawk stock, and look upon this color as an evidence of resemblance to the great progenitor of the breed. Brown horses with tan-colored muzzles and black points, that is, mane, tail and legs, are generally reputed to be unusually tough and serviceable. Dark chestnuts are said to be the most spirited and the most liable to have contracted feet. This is a favorite color for Arabian horses, and also for some branches of the Morgans. Many of the most renowned racers, as Eclipse, Henry, Boston and Fashion have been of this color. By some it is regarded as an exceedingly good sign for a chestnut horse to have one or more small black spots on any part of the body. Others again look with favor upon a few white hairs sprinkled into the coat of a bay or chestnut horse. White, or light gray horses, which always become white as they advance in years, are apt to get stained in the stable; and black ones show dust and sweat too distinctly; while cream, mouse, and other muddy-colored ones rarely have a glossy coat which will pay for cleaning. The piebald or skewbald horse is found wild upon the northern slopes of the Himalaya mountains, and is believed by some to be a distinct species. They are called the Tangum breed, and are domesticated in Thibet and in India. Fine horses of this breed were abundant among the ancient Parthians, Persians and Huns, and in modern times they are raised in considerable numbers in Italy, Austria and Prussia, chiefly for military use. Bucephalus, the famous charger of Alexander, was of this breed, and, in the frescoes of the Vatican, Raphael has represented Attila mounted upon one of this color. Piebald horses are occasionally seen in this country, but they are usually of inferior quality, and employed mostly in circuses. The beautifully spotted horses sometimes exhibited are, not unfrequently, white horses artificially spotted with hair dye. The Arabs often stain the manes and tails of their horses, and in Egypt asses are colored, striped and spotted in the most fanciful manner.

The most universally admired color, the one which wears the best through the entire year, is bright, blood bay with black points, and to this there can be no objection made except by those contrary persons who dislike any thing that every body else likes.

It is generally believed that white legs and feet are more liable to injury and disease than those which are darker. There is, doubtless, much groundless prejudice upon this subject, and many persons of extensive observation deny the principle altogether, asserting that they can discover no difference founded upon color. However this may be, there certainly is no objection to black hoofs and legs of a darker shade than the body.

The quality and quantity of a horse's hair are quite as worthy of consideration as its color, particularly by those who groom their own animals. A fine, short, thin coat is very desirable, as a heavy-haired horse can never be thoroughly cleaned without the greatest difficulty, and when wet with sweat can hardly be rubbed dry.

As many of the best trotting horses, especially those from the North, have a thick, shaggy coat, the custom has been adopted quite extensively in Boston and elsewhere, of clipping, or singeing the whole body so as to leave the hair only about an eighth of an inch in length. It is claimed by those who advocate this singular practice that their horses perspire less freely, are less inclined to colds and coughs, look much better and are more easily cleaned. In a recent standard English authority upon the horse, these operations are very highly recommended and are said to promote the free escape of perspiration, to render the skin soft and moist, to increase the endurance, wind and health of the horse and to cause a very considerable saving in the amount of food necessary to keep him in good condition.

The process of clipping with scissors, or singeing with a lamp, is very tedious and troublesome and requires much skill on the part of the operator. It is not probable that the people of Massachusetts will generally adopt the custom of paying ten dollars per annum to have their horses deprived of their warm coat provided by nature to protect them against the inclemency of our cold and variable winters.

It must not be forgotten that a horse may possess all the outward excellencies of the model roadster and yet be worthless from some defect in his internal parts—his nerves, heart, lungs or digestive organs. The real speed, or bottom, or value of a horse can only be determined by actual trial. Hence the necessity, besides the desirableness upon other accounts, of a suitable track for the proper exhibition of those qualities which distinguish very fine horses from their inferior, though perhaps more beautiful competitors, at agricultural fairs.

It often happens that a horse with some obvious fault of structure is gifted with surprising swiftness or endurance, because the exceeding perfection of his other parts enables him to perform admirably in spite of this defect. As it is impossible to tell by the looks of a toad how far he can jump, so we know that horses have run, or trotted well in almost all forms. Thus Bay Middleton, pronounced to be the best racer of the last forty years, was of such shape that an excellent judge of horses declared that, if such a rail as this horse was, should win the Derby, he would eat him and his shoes afterwards. Yet he did win, not only the Derby, but every other race in which he was entered.

The famous racer, Eclipse, was also a horse of this kind, as his history shows. He was foaled during an eclipse of the sun in the year 1764, and when one year old was sold at auction for $375. He was fifteen hands and a quarter in height at the withers and considerably higher at the hips. His shoulders were oblique, but so thick at the top that it was said a firkin of butter would stand on them. He was so thick-winded that his roaring, at full speed, could be heard a great distance. One writer says, "he puffed and blowed like an otter, and galloped as wide as a barn-door." Another informs us that he run with head down, quite regardless of his rider, who could never hold and scarcely steer him, and that he spread his hind legs so wide at full speed that a wheelbarrow might have been trundled between them. His power was enormous, so that he could carry two hundred and twenty-four pounds with ease, and he usually carried one hundred and sixty-eight pounds in his races. No horse could ever pass him and the fleetest of his time could not keep by his side for a space of ten rods. He never felt the whip or spur upon any occasion, and in seventeen months won all the principal races in England, earning for his owner the handsome sum of $125,000. When in training for his first race, some persons endeavored to watch one of his trials. A reporter says, "they were a little too late; but they found an old woman who gave them all the information they wanted. When asked whether she had seen a race, she replied she could not tell whether it was a race or not, but that she had just seen a horse, with a white leg, running away at a monstrous rate, and another a great way behind, trying to run after him; but she was sure he would never catch the white-legged horse, if he ran to the world's end."

Having vanquished all his competitors, Eclipse was withdrawn from the turf and employed for breeding, and earned as a stallion not less than $250,000. When he was fifteen years old, his owner being asked to set a price on him, demanded $125,000, cash, an annuity of $2,500, and the privilege of having six mares served annually by the horse. Eclipse died in 1789, aged twenty-five years, having earned for his fortunate owner the immense sum of $375,000. So great was the reputation of this horse that his sire, Marske, after having been esteemed almost worthless, and covered mares for $2.50, was purchased for $5,000 and kept as a stock horse at the highest price probably ever paid for such a purpose, namely, $500; and some seasons it is said to have been $1,000 and even $1,500.

THE DRAUGHT HORSE.

The essential points of a beautiful, serviceable horse for rapid work, whether under the saddle, or in harness, having been discussed, the horse for slower, heavier labor—such as requires severe exertion at a moderate pace, next demands attention.

In this age and country there is no use for the gigantic, plodding dray horse, which excites the admiration of the stranger in London or Liverpool; nor is there a demand for a very large number of mere draft horses such as were formerly employed in the transportation of merchandise. For most draft purposes, large, stout roadsters, very properly called horses of all work, are best suited to the wants of the people in this Commonwealth.

The famous black draught-horse of England often attains a weight of more than 2,000 pounds, but such animals are monsters, and cannot be worked with any profit. In fact these immense horses serve rather to gratify the pride of their owners than to enrich them, and the finest of them are bought by the wealthy brewers of the large cities. Seven of them before a truck, laden with an indefinite number of beer barrels, certainly make a magnificent team, very like a team of elephants in more than one respect.

For use about railroad stations in hauling cars, and for trucks and other heavy work, especially in the cities, are wanted a limited number of stout horses from 1,200 to 1,500 pounds in weight. They should have small heads, indicative of activity and intelligence, short, thick necks, broad chests and backs, short, powerful limbs, very hard, prominent muscles, and above all things, an honest, self-reliant, unflinching spirit.

All horses, and especially those whose work is usually performed at this pace, should be taught to walk in a correct and rapid manner with a cheerful, lively step. A good, active horse can be trained to walk a mile in from nine to twelve minutes, yet most will occupy twenty to thirty minutes in walking this distance. Of course the faster a horse walks the more valuable he is for almost any kind of labor, and it is a pleasing evidence of progress that many agricultural societies have, the last year, offered premiums for the best walking, as well as for the best trotting horse.

THE USE AND BREEDING OF HORSES.

Fifty years ago, when there were no railroads and few other roads worthy the name, nor light wagons, nor mowing, nor reaping, nor threshing machines, while the world was yet asleep and men did not care to move faster than four miles an hour, never having dreamed of a mile in three minutes, there was little occasion for endeavoring to improve the breeds of horses in this country. Now the times are changed, and we are changed with them. The world rushes on and we must, and therefore the question is continually heard, "Where can I get a better horse?" Once people paid some regard to the price of a horse, but now the main inquiry is, "What can he do?" Incredible sums are given for the finest animals, and there are many buyers where there is one first-rate horse for sale. More horses are now sold every year for $2,000, and upwards, than were sold for $200, and over, twenty years ago. Then $100 would purchase one of the best horses, now it will hardly buy a young and sound one of any sort. During the past year, as the newspapers inform us, one horse has been sold in this country for $25,000—and, in England, one for $22,500, and three others for $15,000 apiece.

This clearly shows that the supply of fine horses is not equal to the demand, and that intelligent, well-directed efforts to raise them would be amply rewarded.

The breeding of race horses, whether for running or trotting, has fortunately never been a profitable business, and never can be, because where speed is the sole object only the fastest few are very valuable, while the remainder are not generally well adapted for ordinary service. But there can be no doubt that either fine roadsters, spirited, fleet, and hardy, or a larger slower horse for draught might be bred with great profit almost anywhere in New England.

To accomplish this successfully it is necessary that the farmers, as a class, should know much more definitely than at present what constitutes a good horse, and understand those points in the structure, gait and style of a fine colt, by which a shrewd horse-dealer is enabled to select him at once from a dozen inferior ones which appear equally valuable to his ignorant owner. They should also endeavor to become familiar with the principles in accordance with which breeding animals must be chosen and crossed in order to obtain sound, vigorous colts of the desired kind; and always study to produce either superior roadsters, or good draught horses, and not mongrels. These last will always be too numerous, notwithstanding the best directed efforts to procure something else. In this progressive age, when so many intelligent men are engaged in the laudable attempt to improve our various breeds of domestic animals and the standard of excellence is so high, he only deserves, or has reason to expect, great success, who aims at raising the very best kinds in the very best manner.

In regard to the economy of breeding horses instead of neat cattle, or sheep, the experience of the Vermont farmers during the last twenty years, as well as their present success in the business, seems to show conclusively that where pastures are good and cheap no stock can be raised more profitably.

Many of the most successful breeders in Vermont depend entirely upon the sale of the colt for their remuneration not only for the actual cost of rearing the same to a marketable age, but also for the service of the stallion, and the use and keeping of the mare for the year. It is deeply to be regretted that so many of them employ for this purpose mares which are wholly incapacitated for ordinary labor by disease; but when an old mare, so far used up as to be sold for $15, produces in succession three such colts as Ethan Allen, Redleg, and Black Hawk Maid, it is impossible to convince people that it will not pay to breed from such.

In nearly all cases of disease, whether of the bones, the muscles, the breathing or the digestive organs, there is a constitutional predisposition to such disease before its development, and this weakness of constitution will, under the circumstances, be increased, and of course hereditary. Fortunately for the breeder, but unfortunately for the purchaser, this defect is rarely discovered until after the colt has been put to active service. For this reason, if for no other, there will always be an abundant supply of weak and unsound horses.

Another very erroneous practice of breeders in this country is the use of popular stallions, at exorbitant prices, without any regard to the number of mares which they are allowed to cover. In England, the best stallions serve only twenty mares a season, while here they are rarely limited except by the number of mares offered. Ethan Allen has covered 110 mares at $100 each, in a single season, and the North horse as many as 150, at $50 each, for several successive years. The natural consequence of this excess is that the colts resemble their sire less than they otherwise would, and inherit less soundness and vigor of constitution.

In the best agricultural districts of France and Great Britain, horses, or mules, are almost exclusively employed in the labor of the farm, instead of oxen, while neat cattle are bred principally for beef and milk. In some parts of the latter country, the farmers work breeding mares and stallions and sell their colts when from six to eighteen months of age; and in other districts, they buy colts and use them carefully from the time they are two years old until they are fit for market.

There are unquestionably many farmers in this State, who from the peculiar location and character of their land can raise and employ oxen more advantageously than horses, or perhaps even than mules, and the object of discussing their respective merits is simply to induce those, who work oxen because their fathers did, or because they always have, to give the subject the consideration which its importance demands.

It is believed to be more economical to work horses, or mules, instead of oxen, upon farms which require the constant use of a team, for the following reasons:—

First, it has been estimated in England that it costs more on a highly cultivated farm to keep an ox team, than a horse team capable of doing the same amount of labor. In other words, three working oxen will consume the produce of more acres than two horses. It has been recently stated that it costs $100 per annum to keep a farm horse in England; that the average expense of cultivation upon good farms was $40 per acre, and the net profit $60 per acre.

Secondly, the man who drives good horses imbibes their spirit, and labors with more activity and courage than he would, if accustomed to wait for the slower motions of the quiet ox. Thus the moral influence of horses is, in this respect at least, of considerable value.

Thirdly, there are many agricultural implements of modern invention, which can be worked advantageously only by means of horses, such as the machines for hoeing, planting, mowing, raking, threshing, &c. Horses are also indispensable for going to mill, to market, and many other places where farmers like to go.

Fourthly, where the cultivated land is distant from the barn, the transportation of manure and crops is much more economically effected with horses. There are, also, many occasions in the year, as in ploughing, haying and harvesting, when it is necessary to accomplish as much work as possible in a little time, and oxen cannot be hurried.

Fifthly, it is objected to the employment of horses, that there are places upon many farms, where they cannot or will not work so well as oxen, as in wet meadows, in the woods, and on stony or stumpy land. In reply, it may be affirmed that horses of the right breed, well trained and driven, will perform admirably where any animal ought to be used, and that upon marshy ground, with the aid of pattens or rackets, they are much better than oxen.

An excellent racket has been recently patented by H. B. Davis, of Lexington, and is for sale at the agricultural stores in Boston. It consists of a piece of oak board eight or ten inches square, so ironed that it may be readily attached to the horse's foot, and with these, it is said a horse will go safely upon any soft ground where a man can walk. The cost is four dollars per set.

Sixthly, it is asserted by those who prefer oxen, that they are less subject to disease and accident than horses.

In consequence of his more ambitious spirit and greater activity, the horse is undoubtedly more liable to be overworked, but, if properly bred and well treated, he will not often fail until rendered infirm by age.

After the trouble of training them, oxen rarely work more than three or four years, while horses may be kept in fine condition, at least, five times as long. It must be acknowledged, however, that this is not commonly done, and that an immense amount of property is annually wasted by the cruel neglect and abuse of horses advanced in years. Men are apt to imagine that as soon as a horse is a dozen years old, when he should be in his very prime, they must dispose of him to the highest bidder, because he will soon become unsalable. Being sold at a low price, the unfortunate animal generally falls into the hands of a master deficient in both money and intelligence, and consequently receives less grain and less care in his declining years than he enjoyed in early life. He is, also, often overworked; his feet are neglected, and he becomes lame; his accustomed bed and blanket are withheld, and he becomes rheumatic; his teeth are allowed to get out of order, so that he cannot masticate his food, and then his digestion is impaired, his strength forsakes him, and he comes to an untimely end. Who has not been saddened by the thought of the lamentable fate of old horses?

Among the many valuable lessons taught at the Fourth National Exhibition of Horses, held in Springfield, in September, 1860, was an excellent one upon this subject. Lewis B. Brown, Esq., of New York, has justly received great commendation for showing to the public how much kind and judicious treatment will accomplish toward the renovation and preservation of aged horses. He exhibited a four-in-hand team of horses, whose average age was twenty-seven years, and whose appearance and speed were well calculated to modify, very decidedly, the common opinion respecting the capabilities of horses in their teens, and to induce reflecting persons to doubt the expediency of parting with valuable animals for half their real worth, merely because they were advancing in years. The nigh leader of this famous team was thirty-five years old, and had been rescued, fifteen years before, by Mr. Brown, from the hands of the man, who was about to kill him as worthless, on account of his great age. The off-leader, though perfectly blind from an accidental injury, and twenty-five years old, displayed all the pride, courage and activity of a colt, and as he came down the home-stretch amid the cheers of the delighted multitude, was evidently conscious that he was the worthy object of their admiration. These words of the poet respecting the renowned racer, Lexington, may be aptly quoted with reference to him:—

> "Lead him forth, the sightless hero!
> Round him group the noblest steeds;
> He will match the proudest horses
> Of the famous racing breeds.
> Now he hears the hum of voices—
> Voices blending in his praise;
> And he longs to meet the glances
> Of the eyes that on him gaze."

The average length of the life of horses in Massachusetts is variously estimated by those who have responded to the inquiry respecting it, at from seventeen to twenty years, and mares are thought to live about three years longer than geldings. It is well known that horses have often been quite serviceable at thirty years of age, and sometimes even at forty, and it is very probable that the average life is longer than is generally supposed, as it is absolutely impossible to determine the exact age of an old horse, except from his history. It is a curious fact that horses seem to advance in age very gradually after becoming nine years old, and those which, in the opinion of their owners, are more than twelve, are very rarely seen.

But, finally, the most plausible arguments in favor of working oxen are, that yokes are cheaper than harnesses, which cannot be denied; and that the ox at last is turned over to the butcher.

In Hamburg, Vienna, Paris and other cities of Europe, there are markets for the sale of horse-beef, and it must be confessed that no good reason can be adduced against the practice of eating it. The horse is the most dainty animal in the world respecting both food and drink, and the objection that he does not, like the ox, throw up the contents of his stomach and eat it over again, is not important.

The Kalmucks, of Siberia, live almost exclusively upon the raw flesh of the horse cut into slices, and made tender by being bruised and steamed under the saddle for half a-day. The juice of the dead horse is thus intimately mingled with that of the living one, and the flavor becomes exquisitely "horsey." This meat is washed down by copious draughts of fermented mare's milk, taken from a bottle of horse-hide which is never rinsed. The principal dishes at a grand Tartar feast are roasted horses' heads and sucking colts.

The Indians of Chili are said to drink the blood of their mares, which are slain for food, mixed with alcoholic liquors, when they can be procured. They believe that when they die they will be transferred to a paradise, where they will always be mounted on fine horses and be eternally drunk.

But, allowing that the flesh of the horse be not eaten, and he becomes at last nearly, or quite, a *dead* loss, it does not by any means follow that oxen can be profitably kept till six or seven years of age, even though the city butchers will pay a higher price for the beef.

The English breeders of Short-horn cattle have unquestionably discovered the true secret of raising beef most economically. They take the animals which have the greatest aptitude to ripen early, and lay on flesh rapidly, and have them ready for market at three years of age, thus securing both a large profit and a quick return.

It appears, therefore, that if superior horses command an exorbitant price, or cannot be found, and if it be more economical to employ horses, or mules, instead of oxen in farm labor, these animals ought to be raised in larger numbers and of better quality.

Before attempting to state in detail the best method of accomplishing these results, it is necessary to describe briefly those foreign breeds of horses, which seem to surpass our own in any desirable qualities, and, also, to relate the principal facts respecting the best American breeds.

BREEDS OF HORSES.

The horses of the Northern States are justly celebrated for their many excellent qualities, and there are very few breeds in other countries which surpass them in any important particular. The limits of this report will permit the description of only three foreign varieties, viz: The Arabian horse, including under this name the horses of Arabia, Turkey, Persia, and Northern Africa, which are of a similar form and especially adapted for the saddle; the English Thoroughbred horse, which is a variety of the Arabian, improved and enlarged by careful culture; and the Clydesdale horse, which is the best draught horse in the world. These are the only foreign breeds at all essential in the improvement of our own, and of these the

Clydesdale is by far the most needed, at present. The improved Norman horse of France would doubtless prove an admirable substitute for the Clydesdale in the production of stout horses for the carriage or for draught.

The Arabian Horse.—This horse is particularly worthy of mention because it is the original stock from which our finest breeds have been derived. There are, of course, many varieties among the different tribes and nations of the Levant, but the most perfect and highly prized are called the Kochlani, and are found chiefly among the Bedouins. The pedigrees of these horses are said to be preserved with much exactness, though not in writing, and with real oriental exaggeration often extend back two thousand years. Great care is exercised to perpetuate the breed in the utmost purity, and mares of the best blood and form are rarely, or never, sold. Stallions, however, are not ridden nor castrated, but, with the exception of the finest which are reserved for the stud, are disposed of wherever they will command the most money. The mare is particularly valued because her produce constitutes the principal income of her owner; because she is less quarrelsome than the stallion, an important consideration where there are no stables; because she does not neigh when approaching strange horses, thus announcing the coming of her robber owner; and because she is thought to be more capable than the horse of enduring hunger, thirst, heat and labor. In most other eastern countries stallions are much preferred to mares as being more noble, spirited and hardy. In the Barbary States a man is ashamed to be seen mounted upon a mare, and geldings are unknown, as the Koran forbids castration.

In England and elsewhere, racers are never gelded, and in France and Italy stallions are extensively employed in post-service by government, and are also worked by private individuals very generally, both upon the road and the farm.

The custom so prevalent in Great Britain and this country of castrating stallions designed for ordinary service was introduced about the year 1500, in consequence of laws intended to prevent the deterioration of the breeds of horses which prohibited stallions running at large. Mares, also, were then first brought into common use because found to be tougher, more spirited, and less liable to disease than geldings.

It is a question worthy of consideration, whether, with the present improved methods of subduing and educating horses, stallions might not be more generally preserved in their original strength and beauty with decided advantage.

The greatest objection to them perhaps is their almost unconquerable disposition to neigh at certain seasons. It is said that in Hungary the practice prevails of cutting across the septum naris, or cartilage between the nostrils by a horizontal incision, and that this destroys the power of neighing and improves the wind by enlarging the nostrils. If the neighing of stallions and especially the braying of asses and mules could by so simple an operation be suppressed, it should always be performed.

Arabian horses are of small size, rarely exceeding fourteen and one half hands in height, or nine hundred pounds in weight. Their limbs are very clean and delicate, and their pasterns long and sloping. They are smoothly and compactly built, though rather narrow chested. Their shoulders are oblique and well furnished with muscle, their withers high and thin, and their heads are often absolutely perfect, being fine in the muzzle, broad and full between the eyes, and adorned with most beautiful, lively and expressive ears. They are usually treated with kindness and are exceedingly gentle and intelligent.

The foal at the time of its birth is not allowed to fall upon the ground, but is received in the arms of its owner and washed and caressed like an infant. To avoid injury to the dam and her future progeny, as she is expected to breed every year, the foal is weaned when thirty days old, and fed for one hundred days on camel's milk, when it begins to eat small quantities of wheat or barley, which is to be its principal food in after life.

The Arab usually feeds his mare twice a day with five or six pounds of grain and a handful of straw, if he has it, and at evening gives her a little water. She remains saddled all day, either loose or fastened near the tent, to be ready for any sudden emergency. Although thin in flesh, except when grass is abundant, these animals possess great speed and remarkable endurance, having been known to run more than one hundred miles without halting, and to go without food, or drink, for several days. They are taught to gallop to the tent when called; to pick up things from the ground and give them to their riders at the word of command; and to stand still in the scorching sunshine while their masters sleep securely in the shade of their bodies, assured that they will be disturbed only when danger approaches. The temper of Arabian horses is admirable. They are usually quiet, but easily excited, responding cheerfully to the calls of the rider and participating with great eagerness in the race, the pursuit, the retreat, or the ostrich hunt.

The Arab begins to ride his mare when she is two years old, and subjects her at once to a very severe trial in order to determine her quality. For this purpose, he springs upon her back and urges her at full speed across the desert a distance of many miles, without one moment's respite, and then forces her, steaming and panting, into water so deep, that she must swim. She is then turned loose, and, if she proceeds immediately to eating as though nothing had happened, her character is established, and she is acknowledged to be a genuine specimen of the Kochlani breed.

The color of these horses is generally chestnut, bay, or gray, and rarely black; but the true Arabian is never spotted, nor piebald.

In conclusion, notwithstanding their many good points, considering the uncertainty of every Arabian pedigree, and the fact that the best Thoroughbred horses excel the Arabian in superior size, stouter limbs and greater swiftness, over any country and for any distance, there seems to be little reason for the employment of Arabian stallions for the improvement of our stock.

The fact that the coarse horses found in Great Britain, two hundred years ago, were wonderfully improved by a cross with the Arabian does not by any means establish the principle that this refining process will always and everywhere be advantageous. If carried to excess, the result must be to produce a breed of horses like the Arabians, which are not to be compared in useful qualities with the present excellent breeds either of Old or New England.

The Thoroughbred Horse.—English horses have long been bred with the greatest care for special objects,—the racer for speed;—the hunter for speed and strength;—the hackney for speed, strength, and style;—and the draught horse for the weight and power demanded by his work.

The most famous of these is the Race, or Blood, or Thoroughbred horse, descended through many generations from oriental stock. It must not be supposed, however, that all Thoroughbred horses, or even any of the modern ones, are of pure eastern blood, since there is much uncertainty respecting the pedigrees of the celebrated horses of the olden time. Thus in the pedigree of Eclipse there are at least thirteen mares mentioned of unknown blood.

A Thoroughbred horse of the present day is one whose name is found in "the Stud Book" where the pedigrees of all are carefully recorded.

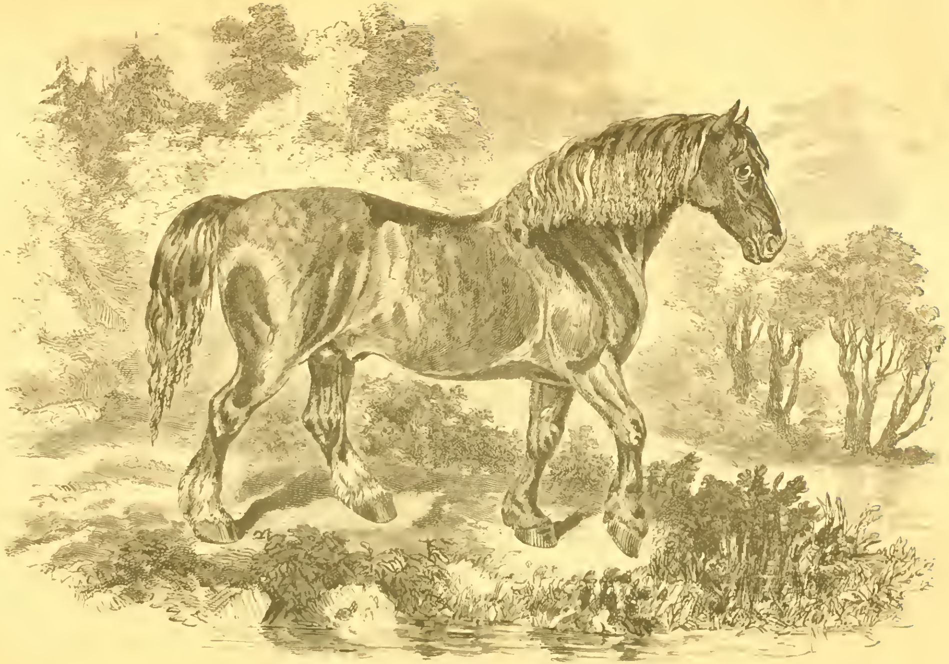
The superiority of the English Blood horse over the Arabian was well established more than a hundred years since, and during the past century no Arabian horses have distinguished themselves either in the stud, or on the turf. So inferior in speed and stoutness are they, that horses of pure eastern blood are allowed to carry, in running, thirty-six pounds less weight than English horses and yet they very rarely, if ever, win a race.

The three oriental horses whose influence seems to have been greatest in the production of this remarkable breed, are the Byerly Turk, who was owned by Captain Byerly, in Ireland, in 1689: the Darley Arabian who was imported into Yorkshire from Aleppo by Mr. Darley in 1712; and the Godolphin Barb, who was first employed in the stud of Lord Godolphin in the year 1731. All the renowned racers of modern times claim among their illustrious ancestors one or more of these horses.

The three English horses which have been the sires of the largest number of winning racers and have consequently been regarded as most influential in the improvement of the breed, are Matchem, King Herod, and Eclipse.

Matchem was foaled in 1748 and became the sire of three hundred and fifty-four winning horses, who won purses and plates to the value of more than $750,000.

King Herod was the most successful stock horse ever known, having got four hundred and ninety-seven winners whose earnings on the turf amounted to more than $1,000,000. He was a horse of fine appearance, with great speed and power though not always victorious like his great grandsire Flying Childers. Herod was foaled in 1758, and his descendants have



BRITAIN. (Clydesdale Stallion.)

been so remarkable that it has been affirmed by an excellent authority that the worth of a modern race-horse was proportioned to the amount of Herod blood in his veins.

Eclipse, whose history has been given, got three hundred and forty-four winners, which earned about $800,000.

There are now in Great Britain, some five hundred breeding establishments which produce annually about fourteen hundred Thoroughbred foals.

There are, also, one hundred and fifty-three race-courses, the most celebrated of which are those at Newmarket, Epsom and Doncaster. The races are patronized and sustained principally by the wealthy nobility, although $25,000 are annually paid by government to aid in supporting the most important ones, upon the supposition that they are essential to the preservation of the horse in his greatest perfection.

Formerly, the courses were six miles in length, or there were heats of four miles each, and the weights carried were heavy, so that the race was a thorough trial of the real strength and speed of the mature horse. Now, yearlings are run for half a mile, and all the best colts and fillies are entered at two years of age, and most of them spoiled before they are four years old, after which they are called aged horses. There are often more than fifty competitors entered for the plate, purse or stakes offered, the value of which sometimes exceeds $30,000.

So great has been the effort to bring forward young stock prematurely for these purposes, that foals of eleven months attain a height of fourteen hands and a girth of five feet; and at two years of age they appear almost grown and well furnished with muscle. This rapid development is followed, as might be expected, in the great majority of instances, by an equally speedy decay, and a sound, old racer is scarcely ever seen.

The average height of the Thoroughbred horse is fifteen hands and three inches, but the average weight seems to be "nothing to speak of," as it is never mentioned. In form he resembles somewhat the Arabian, but is taller and longer. His neck is less arched, lighter and of greater length. His hind-quarters long, deep and powerful, while his legs are long and slender, though the muscles of the arm and thigh are well developed. That the legs are too delicate is proved by the fact that ninety-nine out of every hundred break down in the back sinews, sometimes in the first training and very often in the first severely contested race.

That there have been a few stout, substantial, short-limbed Thoroughbred horses in modern times, both in England and in this country, cannot be denied. Such horses are, however, exceptions to the general type, and are every year diminishing in number. Unless the present foolish system of racing be greatly modified, Thoroughbred horses will soon become mere gamblers' tools, and will be considered utterly worthless for the improvement of any other breed.

It cannot be denied that some of the crosses of this blood with other breeds have resulted in the production of most valuable animals, possessing in an extraordinary degree intelligence, courage, strength and swiftness. Such for instance are the English Hunters, which are able to carry a rider of two hundred pounds' weight at the speed of the fox and hounds over walls, fences, hedges and ditches, through swamps, ploughed fields and streams, across every variety of country, for a distance of many miles.

The inquiry whether the influence of the Thoroughbred horse would be likely to prove beneficial upon the horses of this Commonwealth will be discussed in another part of this report.

THE CLYDESDALE HORSE.

This horse has long been bred with great care and uniformity in that portion of Scotland which also enjoys the enviable reputation of producing the best dairy cattle in the world, namely, the counties of Ayr, Dumfries, Renfrew and Lanark. They derive their name from the river Clyde, which flows through Lanarkshire, where they are very numerous. This breed, like the Morgan, is the natural result of the peculiar circumstances of its location, and has been developed by a favorable combination of soil and climate with the necessities of an enterprising people. In this region, celebrated for its extensive coal mines and prosperous manufactures, as well as for its agricultural thrift, large numbers of powerful horses are constantly employed in hauling heavy freight, and the farmers have wisely and successfully endeavored to produce upon their own soil the animal best adapted to the work.

The Clydesdale horse is about sixteen hands in height and weighs from twelve hundred to sixteen hundred pounds. The most common colors are black, brown, bay and gray. They are sufficiently spirited and courageous, but intelligent, willing, free from vice and very true, steady pullers. Their heads are small and often beautiful, their necks arched, and their legs and feet remarkably good, being of excellent shape, substantial and durable. They are superior travellers, for large horses, and especially famous for their rapid walk, and being often handsome and stylish they are frequently employed as carriage and stout saddle horses.

Professor Low, in his admirable work, "The Domesticated Animals of the British Islands," says: "The long stride characteristic of this breed is partly the result of conformation and partly of habit and training; but, however produced, it adds greatly to the usefulness of the horses both on the road and in the fields. No such loads are known to be drawn at the same pace by any horses in the kingdom as in the single-horse-carts of carriers and others in the west of Scotland; and in the labor of the fields these horses are found to combine activity with the physical strength required for draught."

On the whole, the Clydesdale horses seem to be as distinct a breed and as peculiarly adapted to New England as are the Ayrshire cattle; and it is to be hoped that some of our wealthy breeders of horses will distinguish themselves and benefit the country by the importation of choice stallions and mares of this valuable stock. It would undoubtedly be wisest to preserve the breed in its purity so far as possible, since the attempt to increase the size of our present stock by the use of large stallions upon native mares would result in the production of many coarse and ill-proportioned horses.

AMERICAN HORSES.

These horses, like American stock of all kinds, present a great variety of forms and qualities resulting from the character and habits of the people, the peculiarities of climate, soil and food, and the crossing of different breeds.

In the Southern States, where roads are bad and the travelling done mostly upon horseback, are found horses well adapted to the saddle, the best of which exhibit distinct evidences of their descent from the imported Thoroughbred horse.

In Pennsylvania and Western New York many large, excellent draught horses are raised which are sometimes called Conestoga horses. They are usually of a bay or brown color, and their principal faults are a want of spirit and often too much length of leg.

Many stylish and fast carriage horses are bred in the Middle States, and the greater number of the best roadsters used in and about New York City and Philadelphia contain more or less of English or Oriental blood.

The three foreign horses, whose descendants are now most numerous and celebrated as roadsters, are Grand Bashaw, Trustee, and Messenger.

Grand Bashaw was an imported barb, among whose progeny are the famous stallions, Young Bashaw, Andrew Jackson, Kemble Jackson, Long Island, Black Hawk, and Jupiter.

Trustee, an English Thoroughbred horse, was imported in 1835, and was the sire of Fashion, the best racing mare ever bred in this country, and of many other first-class racers. He also got the renowned trotter, Trustee, who performed, without injury to himself, the unparalleled feat of trotting twenty miles in fifty-nine minutes and thirty-five and one-half seconds. He accomplished the entire distance without once breaking his trot, making the last mile in two minutes and fifty-one and a half seconds. This almost incredible match against time occurred on the Union Course, Long Island, October 20, 1848, the driver and sulky weighing two hundred and ninety-five pounds.

There can be no question that trotting matches, properly conducted, are essential to the most complete development of the breed of roadsters.

The actual excellence of a stallion for getting roadsters, can be determined only by careful training and driving; and without these trials of stock horses, the tendency would be to encourage those of a round, smooth, showy form, and beautiful action, but deficient in that vigor of constitution and perfection of nerve and muscle which characterize the horse of the highest speed and the greatest endurance. It is not recommended by any means to select always the fastest stallion for getting roadsters, as there are many other qualities more important than great speed; but, other things being equal, the horse which can trot his mile the quickest, will be most likely to get fast-travelling, valuable stock.

With suitable preparation and management, not only does a healthy horse suffer no distress from trotting a moderate distance at the top of his speed, but he enjoys it as highly as his driver. The match trotter is peculiarly gifted with powers of locomotion, and his wonderful mechanism can only be appreciated when in full operation. To most persons, a closely contested trot is a beautiful and attractive spectacle, and experience proves that nothing affords a more delightful or harmless amusement for the people, provided the superintendence and associations are of the proper kind. The usual accompaniments of the race course—quarrelling, profanity, intoxication, gambling, and public betting—may and should be always and everywhere forbidden and prevented. The morals of the community are of more consequence than the breeds of horses; but there is no more occasion for immorality in connection with a trotting match, than in connection with an exhibition of skill and swiftness in skating.

But there is no apology for those barbarous matches, which, from their excessive length, overtask the powers of the horse, and often result in his destruction. In England, hunters, of which twenty thousand are said to be kept in the kingdom, are not unfrequently ridden until they can go no further, and are so exhausted that they either die upon the spot, or within a few days, and nearly all are soon rendered unsound, and end their miserable lives as hacks. In this country, fortunately, horses are rarely forced to such unreasonable exertion, yet matches of from ten to one hundred miles are sometimes made, and a suitable regard for the lives of our noblest and most willing servants of the brute creation seems to demand a statute against them. Frank Forester, in his valuable work, "The Horse and Horsemanship of America," thus expresses his views upon this subject: "All these long matches against time are useless, cruel, derogatory to the turf, disgraceful to humanity. They are never accomplished—whether the horse be urged beyond its powers by the torture of the whip, or only by the incitement of its own high courage and emulation, which, every horseman knows, will spur a well-bred animal to die, rather than to give in—without great present distress of the creature, great risk of its dying in the trial—and, in nine cases out of ten, its serious and permanent injury and deterioration, even if it win the match, and appear to win without distress."

"Nine times out of ten such matches are made up by the lowest of the low, and the object is solely to win money."

It has been demonstrated at a fearful expense of suffering, and the trial ought never to be repeated, that a horse can trot ten miles inside of thirty minutes, twenty miles inside of an hour, fifty miles inside of four hours, and one hundred miles inside of nine hours.

A single mile has been run in one minute forty-two and a half seconds by the American racer, Henry Perritt; paced in two minutes seventeen and a half seconds by Pocahontas; and trotted in two minutes nineteen and three-quarters seconds by Flora Temple.

The most celebrated of all the Blood horses which have been progenitors of fine roadsters in this country, is imported Messenger, who is generally conceded to have been the best stock horse ever brought to America. He died in New York in 1808, and, though by no means a model horse himself, he was the getter of a vast number of famous running and trotting horses. He was a son of Mambrino, who was one of the most superb horses ever known. He is described as a gray horse, with a large, bony head, a short, straight neck, low withers, and upright shoulders, while his windpipe and nostrils were very large, and his legs, barrel, loins, hips, and quarters, absolutely faultless.

Among his descendants were the trotting stallions, Mambrino, Hambletonian, Messenger, Abdallah, and Engineer, and the renowned Lady Suffolk, who was for fourteen years queen of the trotting course.

Lady Suffolk was got by a great-grandson out of a great-granddaughter of imported Messenger, and was foaled in 1833, on Long Island. She was on the trotting course sixteen years, and won eighty-eight matches out of one hundred and sixty-one trotted, earning the sum of $35,000.

So excellent have the Messenger horses proved in the various branches of Messenger, Abdallah and Hambletonian, that more than eighty of the horses entered for exhibition at Springfield in

1860 were claimed to be of this stock, and almost every good-sized, fast-travelling, gray horse is called a Messenger. The genuine descendants of Messenger have been justly celebrated as active, tough, serviceable and long-lived horses, and it is singular that they should not have been preserved in greater purity.

THE MORGAN HORSE.

In New England, we find in the highest perfection the horse of all work, bred by the universal Yankee, the only man who can be "Jack-at-all-trades," and good at all. This animal possesses such an extraordinary combination of valuable qualities as enables him to excel on the parade ground, as a spirited charger; on the road as a stylish driving horse, intelligent, prompt and enduring; on the farm as a fine, pleasant, powerful work-horse; and on the track as a fast and beautiful trotter. During the last fifty years, especially in Vermont, these horses have been bred in great numbers, and with considerable care, and they have now become famous all the world over, so that they are beginning to be exported to England for breeding purposes. They derive their name, Morgan, from a small, partly Thoroughbred stallion, foaled in Springfield, Mass., in the year 1793, and afterwards kept at Randolph, Vermont. This horse having acquired some reputation as a stock horse, was named after his first owner, Justin Morgan. He left three sons, whose progeny have become celebrated as the three families of Morgans, viz.: the Sherman, the Woodbury, and the Bulrush Morgans.

The famous stallion, Black Hawk, is thought, by some, to have been got by Sherman Morgan out of a half-bred English mare, said to have been raised in New Brunswick, and to have been of a black color, a fast trotter, and a very fine animal. This horse was foaled in 1833, in Greenland, New Hampshire, and when four years old, was purchased for $150, and used as a roadster by Benjamin Thurston, of Lowell, until 1844. As he was a beautiful, spirited horse, able to trot his mile in two minutes and forty seconds, and as the few colts he had got proved remarkably promising, he was then bought by Major David Hill, of Bridport, Vermont, who kept him until his death in 1856. Black Hawk was about fifteen hands high, and weighed nine hundred and fifty pounds. His skeleton is preserved in the Museum of Natural History, at the State House in Boston. He was a horse of almost perfect form for a roadster, compact, symmetrical and muscular, and possessed of most beautiful head, neck, and limbs. He was active, elegant, spirited, and pleasant, and marked his offspring with his own peculiar excellencies and characteristics, even to color, more decidedly perhaps, than any other American horse. Although the mares covered by him were, as a general rule, the best in the country, yet his stock was so universally superior, that his owner used to say that Black Hawk would get a good colt out of any thing. His numerous and justly esteemed descendants constitute the best breed of roadsters ever known, combining the intelligence, courage, elegance, life and endurance of the Thoroughbred horse, with sufficient bone and substance, and the finest possible trotting action.*

Ethan Allen, one of the most beautiful, fastest, and best gaited trotting stallions in the world, was got by Black Hawk out of a Messenger mare.

At the fair in St. Louis, in 1859, five out of the six best roadster stallions on exhibition, were Black Hawks, and the prizes of $1,000 in 1859, and of $1,500 in 1860, for the best stallion of this class, were each awarded to a son of Black Hawk. More than one hundred horses of this breed were entered at the show in Springfield, in 1860, and nearly one-half of all the successful competitors were Black Hawks.

Nearly one-fifth of all the stallions described in "Linsley's History of the Morgan Horse," are sons of Black Hawk, and fine stallions of this breed are not only numerous, but command higher prices than any others in the country.

Of the Woodbury Morgans, perhaps the best samples are Gifford and his descendants, particularly the Hale Horse, or Green Mountain, 2d, owned for many years by Silas Hale, of Royalston, Mass.

These horses have all the fire and action and sometimes the perverse disposition, as well as the round, smooth, compact form of the Shetland pony, united however with sufficient size and remarkable muscular power. They are in fact a breed of large ponies.

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* Since the earlier sheets of this report went to press, and on further investigation of the subject, we are satisfied that the better opinion is that Black Hawk was sired by Paddy, a very superior stallion kept, at the time, in the same stable, and that there is little or no probability that he had any Morgan blood in him.

Of the Bulrush family the Morrill horses are perhaps as popular as any; though Morgan Emperor, the sire of North Star, and of the famous trotting horse Chicago Jack, was a very excellent stallion.

The Bulrush Morgans, so far as they can be distinguished from the other families, are rather remarkable for strength and bottom, than for speed or beauty. It has been said that "a smart, active boy would wear out a wrought iron rocking-pony sooner than a grown-up man could break down the constitution of a Bulrush horse."

The Morgan horses have been crossed in every direction, and of course, have at present but little claim to the name from the amount of original Morgan blood in their veins. Compared, however, with the horses of any other country, they are quite a distinct breed, peculiar for their compact, muscular forms, their activity and strength, their soundness and endurance, their comeliness, usefulness and perfect trotting action. Upon examining the pedigrees of all the most celebrated Morgan stallions, we see that there is a large infusion of English Racing blood in them. Thus Justin Morgan was at least half Thoroughbred; Sherman, three-quarters; Woodbury, one-quarter; Bulrush, one-quarter; Gifford, five-eighths. Fifty of the best stallions in Linsley's book are out of half-bred mares; twelve out of quarter-bred; five out of so-called Messenger mares; and nearly all the Morgan stallions of any note get racing blood from their sires, to the extent of, at least, one-eighth.

Thus it appears that, as in England, very valuable horses for all work and especially for the road, have been produced by the judicious crossing of the Thoroughbred with other breeds; so in this country our best horses owe much of their superior excellence to a mixture of Racing blood. Just what proportion of this is best adapted to produce the finest roadsters has never been definitely decided; and it is by no means an easy problem. Thoroughbred horses rarely have the essential gift of trotting sufficiently square and free to please an American taste; and their feet and limbs are not quite large and substantial enough for rapid driving on rough roads. Still, there are some compact, muscular, good-limbed horses, of the purest pedigree, which could hardly fail of getting magnificent roadsters when crossed with the largest and fleetest of the Morgan mares. The half-blood sons of this cross, being trained to trot, would be even better suited to become sires of fast trotters.

Notwithstanding the undeniable excellence of the best form of the Thoroughbred horse, and the great improvement in our roadsters, which has resulted from the use of such stallions as Messenger, Trustee, Duroc, Henry and Eclipse, it is by no means certain that our present breed requires for its perfection or preservation, (as some would have us believe,) continual recurrence to this blood.

Frank Forester claims that the excellence of every breed of horses and of every individual horse, consists in the possession of oriental blood, yet most of the best trotters have been what he is pleased to call cold-blooded. The wonderful horse, Dutchman, trotted three miles in seven minutes, thirty-two and a half seconds, and four miles in ten minutes, fifty-one seconds, which is the fastest time on record. He was purchased in a brick-yard in Pennsylvania, where he was engaged in the rather slow work of trampling clay, and is described as a great, coarse, ugly, brown brute, with a short, hog neck, a fearful borer, going with his head down in the most ungainly and disagreeable manner. No body could suspect him of possessing a trace of pure blood and he was thick-winded, but he could trot at a tremendous rate for a greater distance than any other horse.

Blood of the right kind is an excellent thing, but all good qualities have not been given to any one breed exclusively.

The Thoroughbred horse of England has been produced by the steady prosecution and scientific management of breeding, which Professor Percivall says, means "not only the procuration of original stock of good description, but the continual progressive cultivation of that stock in the progeny by the greatest care in rearing and feeding, and by the most careful selection. On these two circumstances, and particularly on the latter, a great deal more depends than on the original characters or attributes of the parents. By these means, we have progressed from a good to a better, losing sight of no subsidiary help, until we have obtained a perfection in horse-flesh unknown in the whole world beside."

In the same manner, by the judicious selection of the very choicest breeding animals, both male and female, of the best pedigree, and by proper attention to the wants of the young stock, now too much neglected, there is reason to believe that New England might produce a breed of American Roadsters almost perfect. Possessing as she does, the most suitable climate, an abundance of the best food, the best drivers and roads for fast trotting and the choicest breeding animals, nothing is lacking but a little of that enterprise and discretion on the part of horse-breeders, by which her cattle-breeders have been conducted to such complete success.

The greatest hindrance in the way of breeders is the difficulty of obtaining the services of suitable stallions at reasonable rates.

In those countries which require large numbers of fine horses for military purposes, the governments give great encouragement to horse-breeding.

Napoleon, the great, imported more than two hundred Arabian stallions for the improvement of the breed of horses in France. The present Emperor also bestows much attention upon the subject; and stallions of the best quality are purchased by government and stationed in the different districts of the empire.

During the last nine hundred years the English government has done much at various times for the perfection of their breeds of horses. Many hundred stallions and mares have been imported by different kings from Flanders, Italy, Spain, and especially from the East.

Henry the Eighth enacted most tyrannical laws respecting both the use and the breeding of horses. He forbade any stallions to be preserved, which were less than fifteen hands high; and required his officers to destroy any "unlikely tits," whether stallions, mares, or foals, which would be liable to injure the breed. He also compelled every man, whose wife wore a French hood, or a velvet bonnet, to keep for the saddle one trotting stallion, while dukes and archbishops were obliged to have seven.

The Duke of Augustenburg resides upon the island of Alsen, in the Baltic Sea, and devotes much attention to the breeding of fine horses, striving to produce such as are distinguished for beauty and general excellence rather than for speed. The native horses of this region are very large and showy, being sometimes even eighteen hands high and very spirited. To improve upon these, the Duke keeps a stud of fifteen of the most carefully selected English Thoroughbred stallions, and thirty mares of the same blood for crossing with the native horses. He allows his stallions to cover without charge six hundred of the best mares belonging to the peasantry of the island. "He keeps a register of them, and in the majority of cases examines the mares himself, and chooses the horse which will best suit her form, her beauties, her defects, or the purpose for which the progeny is intended." Another very important rule observed both by the Duke and his tenants, is never to sell from the island, at any price, a first-class breeding mare.

If the farmers of New England would adopt a similar principle of action, it would not only be much to their advantage pecuniarily, but would wonderfully favor the perfecting of the breed of horses and prevent any danger of deterioration.

The most magnificent establishment in the world for breeding horses belongs to the Austrian government, its special object being to furnish the choicest stallions at a moderate price to breeders. It occupies a fertile plain of forty thousand acres, at Mesohagyes, and the whole farm is surrounded by a deep ditch and a belt of forest trees sixty feet wide. Here are kept for breeding purposes fifty stallions and one thousand mares of the finest quality, besides two hundred mares and six hundred oxen employed in cultivating the land. When four years of age the best colts are selected for home use, while all the remaining stallions of superior quality are sent to different parts of the country for the improvement of the breed, being sold at a regulation price of $500 each. The poorer colts and mares not wanted on the farm are sold at auction or employed in the army. The annual expenses of this immense stud, amount to $60,000, and are entirely defrayed by the sale of stock.

Since in this country we cannot hope for government aid, and since there are as yet but few wealthy men interested in horse-breeding, while stallions of the best quality are very costly, there seems to be only one way in which they can be procured.

This is by the formation of stock companies, or horse-breeding associations. Such companies are not at all uncommon in the Western States, and, if well conducted, can scarcely fail of success.

Suppose, for instance, fifty men interested in horse-breeding meet together and decide, after suitable discussion, what kind of stallion will best suit them. Then let them appoint a committee to purchase and take care of one, every member of the association taking one or more shares of the stock, and having the privilege of sending a proportionate number of mares every year to the horse. The company should limit by vote the number of mares, and every one ought to be approved by an examining committee, as fit to breed from and adapted to cross with the horse. In this way the members of the association could be certain of pecuniary profit, if the horse lived, and, if he died, the loss would not be insupportable. Indeed, almost any horse would pay for himself in two or three years.

RULES FOR HORSE BREEDERS.

First. Resolve to raise either evenly-trotting roadsters, heavy draught horses, or saddle ponies; and remember that "like begets like." Therefore, select both dam and sire with special reference to the kind of stock wanted, and, if you would be certain of the quality of the colt, the sire and dam must resemble each other, the more nearly the better, and must be of good descent.

Second. Never breed from an animal known to have a special weakness of constitution—never from one which has become blind from hard work, a cold, or cataract—never from one which has any disease of the respiratory organs—never from one with any disease of the bones, as spavin, or ring-bone—never from one with any defect of form, which either predisposes to disease, or renders unsalable, as curby hocks, large, ugly head, long or lopped ears, naked tail, contracted, or otherwise misshapen feet—never from one of decidedly bad color or temper. Perhaps the most common disease of the finest and fastest breeding mares is founder, either of the feet or chest, and it is difficult to decide how much these affections vitiate the blood, and produce a tendency to the same in the offspring. Undoubtedly some horses are more liable to these ailments, from a peculiarity of constitution, or from some defect of structure, than others, and it may be safely affirmed that the colt of a sound mare, other things being equal, is worth much more for service, if not for sale, than one from a mare which has become stiff or lame from disease, either of the feet or the muscles.

Third. Never breed from animals merely because they are fast, but select for breeding roadsters, such as are of good pedigree, and possess as many of the points of the model animal as possible, especially those which indicate a firm constitution, and never breed from one which has not a beautiful, smooth, square trot. The mare will be fast enough, if she can trot handsomely a mile in five minutes, and is greatly to be preferred to one which can go with "hitching" and "singling" a mile in three minutes, or less. She should be of as perfect form as possible, though if the body be rather longer and more capacious than is desirable for a model roadster, it will not be objectionable. It is very important that she be a good milker.

To breed with such a mare, select a stallion with small head, stout, well-formed legs and feet, short, broad back, oblique shoulders, and able to trot in model style at least a mile in three minutes. He should never be long-legged, nor much heavier than the mare. If it be desirable to increase the size of the progeny, it may be much better accomplished by taking superior care of the mare while with foal, and while suckling, and by keeping the young animal in comfortable quarters, and supplying it with an abundance of the most suitable food.

Fourth. If a valuable breeding mare has some obvious defect of form, she should be covered by a horse as perfect as possible in this particular, but not by one with any opposite defect. Never employ for breeding, an animal defective in any respect, when a perfect one is accessible.

Fifth. Crosses between very dissimilar animals can never be relied on to produce valuable colts, as they are liable to be cross-made or unsymmetrical in form.

Sixth. It is unprofitable to breed from weak or unsound animals, or from such as are not tolerably well-made, and possessed of first-rate ability to perform the ordinary service of a horse of the kind. But, if the dam and sire are judiciously chosen, and the colt properly reared, he will, in ninety-nine cases out of a hundred, be worth, at four years of age, all he has cost, and pay a fair, and sometimes a large profit.

THE STABLE.

A suitable stable is the first requisite in the care of a horse. It should be capacious, well-ventilated, but warm, well-lighted, and so situated as to be free from dampness. Stables are not unfrequently built over cellars or depressions in the soil, which receive the manure, and are often partially filled with water. The constant evaporation from this pond keeps the entire stable damp and chilly, and thus in an excellent condition for causing founder or rheumatism, lung fever, colic, and other diseases in the poor, exhausted creatures, whose uncomfortable nights must be passed there. Warmer, but not more salubrious, are stables over cellars, dark and close, which are fuming with the pungent, noxious gases generated by fermenting dung. Such cellars ought always to be very thoroughly ventilated, not merely by an open door or space on one side, but by a constant and abundant circulation of air.

The stalls should be as wide as circumstances will allow, but never less than five feet, in order that the horse may have room to lie in an easy, unconstrained position, and rise without any danger of bruising the points of his hips.

Wherever it is feasible, a loose box-stall twelve or fourteen feet square is by far the most comfortable for the horse, and there should be at least one in every stable, for use in cases of sickness or accident. The difference between such a resting-place, into which the horse is turned loose, and a narrow stall, where his head is hitched up two feet from the floor, as often happens, is much like that between a berth in the cabin of a steam-boat and a nice, double bed.

The floor upon which the horse stands should be as near level as possible, and if it must be inclined to carry off the water, it would probably be more agreeable to the horse to have his fore feet the lowest, as his back sinews are less tense in this position; and it is observed that for this reason horses in pasture usually stand with their fore feet in a hole which they have excavated by stamping.

The English method of having a grate over a closed drain in the centre of the stall is an excellent one.

Another good plan is to lay a double floor, the under one with an inclination of three inches, and the upper one of planks four inches thick at one end and one inch at the other, placed about an inch apart. In this way the standing place is level and the drainage perfect.

Many horses have been seriously injured, besides being made uncomfortable, by being confined in narrow stalls upon inclined floors. In box-stalls, where the horse can move about and take the most agreeable position, it is of course not necessary that the floor be level, and perhaps better that it should not be.

The sides of the stall should be smooth, and if the horse is disposed to rub his tail he may be prevented by fastening strips of plank six inches wide to the partition about three feet from the floor. In a narrow stall there might be danger that the horse would injure his hips upon these planks, but he will soon learn to avoid them in rising.

The common form of rack and manger for ordinary stables is on the whole not very objectionable. When the hay and straw are all cut, the rack is quite unnecessary, and if one be used, it would be much better to set it in a vertical position than inclined, as is usual. The horse would feed more easily and be less annoyed by dust. The edge of the manger should always be protected by a strip of band iron, both that it may not be destroyed and that the horse be not tempted to acquire the vicious habit of cribbing.

The best mode of fastening a horse in a stall is the English one of attaching a light weight to the end of the halter and allowing it to run up and down under the manger, which should always be boarded in front from the floor up. By this arrangement, the horse enjoys sufficient liberty and yet has no chance of getting cast by stepping over his halter.

FOOD OF HORSES.

The food of horses necessarily varies much in different countries.

In Sweden and other northern regions they are often habituated to a diet of fish, and in Iceland, the scanty stock of vegetable fodder is eked out by the addition of soup made of dried whale's flesh. In Arabia, camel's milk, dates, flesh balls, eggs and broth are common articles of food for horses as for men; and in India, balls of flour, butter, salt and spices are given to improve digestion and render the hair sleek and glossy. In France horses are sometimes fed with chopped hay or straw moistened with impure sirup from the sugar works and thrive excellently without grain, which perhaps is not to be wondered at, since mare's milk contains a greater amount of sugar than that of any other animal. In many parts of Europe bread is the "staff of life" to both horse and man, and they may often be seen partaking of the same loaf. This bread is made of rye, beans, pease, oats or wheat, either separate or mixed, and is thought to be a cheap and salutary food. In Turkey, opium, in England, ale, in Portugal, wine, and in Austria, arsenic, are employed as stimulants for the purpose of imparting wind and strength on a severe journey, of refreshing an exhausted animal, or for increasing the beauty of the coat and the spirit of the horse.

The best food for roadsters in this country consists of hay, oats, and carrots, or grass, with a moderate supply of water.

The quantity of hay depends upon the size and work of the horse, but there is more danger of giving too much than too little. Many horses become broken-winded and cribbers from being allowed to stuff themselves with hay. From eight to ten pounds of the very best and sweetest hay—and nothing is better than good Timothy—is an abundant daily allowance. If it is at all dusty it should be cut and moistened with water.

The oats should be of the best quality and the quantity may vary from eight to twelve quarts per day. Oats and hay are much improved by age and are not thoroughly ripe and perfect before they are twelve months old. One or two quarts of corn meal will be a valuable addition to the daily food of such horses as are inclined to leanness; and horses of slow work may be fed upon half corn and half oats, the amount of course depending upon the size of the horse.

Corn alone is too heating, and produces more fat than muscle, and rye is thought to be very dangerous food for roadsters, inducing a condition of the system which often results in founder, especially of the feet.

Four to eight quarts of carrots, either cut or uncut, fed to a horse once a day produce a charming effect in improving the digestion, preventing diseases of the respiratory organs, and rendering the kidneys suitably active and the hair glossy and smooth. No valuable horse ought to be wintered without roots of some kind, and carrots are by far the best.

Salt should not be given on the food, but should be offered to the horse once a week, or a lump of rock salt may be kept in his manger.

Horses should also be allowed, from time to time, access to chalk, ashes, or common earth, which they will eat with avidity in certain conditions of the system. It has been said with some reason that these substances are the best preventives of cribbing, wind-sucking, &c., habits which probably result from indigestion in some form.

Glauber's salts is sometimes advantageously given to horses, especially in the spring, as a mild aperient, and is readily eaten by them.

Saltpetre and all other medicines should be administered as rarely as possible, and never, unless absolutely required by a morbid condition of the horse.

A bran mash, prepared by pouring boiling water upon from four to eight quarts of wheat shorts and covering it over to cool, is an excellent thing for a horse occasionally, softening the dung, and increasing the tone of the digestive organs. Many horsemen give a mash to their horses every Saturday night instead of their regular food of grain, and the practice is most judicious. By the proper use of mashes, the necessity of physic, formerly so often given, is almost entirely obviated. When carrots are fed, mashes will be seldom required.

No horse should ever be allowed to drink more than a pailful of water at a time, but should have it offered frequently. Nothing can be more injurious to a horse than to be driven rapidly, or required to exert himself violently, when his stomach is distended with food or water; and the custom prevalent in some countries of causing the horse to fast the night before a hard journey is much more sensible than the common one in New England of stuffing him with an unusual amount of good food.

When a horse is excessively fatigued, or when sufficient time cannot be allowed for him to eat and partially digest a full meal, he may be greatly refreshed by a draught of warm gruel, or, in summer, of cold water containing a small quantity of meal. In winter, a weary horse may be often prevented from chills by permitting him to drink a bucket of luke-warm water. It hardly need be mentioned that a horse when in a heated and exhausted state should never be permitted to drink more than a swallow or two of cold water, unless the exercise is to be continued at once; and even then, the amount allowed should be limited. In trotting matches it is customary to refresh the horse by rinsing the mouth and nostrils with cool, fresh water by means of a sponge or cloth.

The amount and kind of food most economically fed to horses and mules performing severe, constant labor upon pavements, may perhaps be inferred from the practice of the Sixth-Avenue Railroad Company in New York. They employed in 1855, one hundred and seventeen horses, and two hundred and eleven mules, which were driven seventeen miles per diem. The daily allowance of food consisted of ten pounds of hay and fourteen pounds of Indian meal for every horse, and half as much meal for each mule. Ten pounds of salt were allowed per month, and water was given five times per day in winter and oftener in summer.

As it is not profitable to keep a poor horse, so it is unprofitable to keep a horse poorly, and it is more economical to feed a horse at work some grain, than to allow hay only. The practical difficulty both respecting the quality of the horse and the food is, that persons without capital cannot afford to be economical.

The best food for colts after they are weaned is, that which will make them grow most rapidly without becoming fat, and too much pains cannot be taken to keep them in fine condition. The change from liquid or green food to dry hay, together with the chilling influence of the first winter weather, is very apt to to produce derangement of the digestive organs, followed by attacks of parasitic worms within and lice without. If this colt be now neglected and compelled to struggle unaided against these difficulties, he will soon become spiritless, hide-bound, with an anxious look, and staring coat, pot-bellied, and his bones, instead of being fine-grained and sound, will be imperfectly formed, and in the right condition to develop ring-bones and other excrescences. The first winter is the critical period in the life of the horse, and therefore at this time he should have the most careful attention. He should have a warm box-stall for a shelter and resting place during nights and cold storms, and a large, sunny yard to exercise in during fine weather. He should be abundantly supplied with the best of hay, and have a quart or two of carrots daily ; and an additional quart of good oats or wheat shorts will never harm him.

Nothing is so much wanting in our American horses, as that perfection of nerve, muscle, and bone, which imparts to Arabian and Thoroughbred horses their spirit, courage and endurance. The Arab, as has been stated, feeds his colt on the most nutritious food, such as milk, wheat and barley. The Thoroughbred colt is constantly fed with oats from the time he is three months old ; and the mare, both while with foal and while suckling, is never deprived of them. Good horses cannot be produced without good food—the knife will be like the steel from which it is manufactured.

GROOMING.

It is the business of a groom to feed, clean, exercise, and otherwise take care of horses, and his office is one of much responsibility, requiring great fidelity, intelligence and judgment, and an excellent temper. There are very few persons in this country who possess the requisite qualifications, and fewer still who can be hired for this purpose. The want of suitable care, after a hard drive, ruins thousands of splendid horses every year, and many others are seriously injured by want of proper preparation for their work, and by thoughtlessness or ignorance on the part of their drivers. A few hints, therefore, respecting the treatment of horses, may not be out of place here.

The stable is the home of the horse, and should be furnished with whatever is necessary to promote his comfort; and perhaps the first thing to be mentioned as indispensable is a good bed. This should consist of an abundance of clean, sweet straw, which should be entirely removed from the stall during the day, and on no account put under the manger to destroy, by its fumes, the eyes and appetite of the horse. No dusty or musty hay should ever be used about a stable.

In Egypt, dry desert sand is employed for bedding for horses, and in that warm climate is admirably adapted to serve as a substitute for straw. In this country, a similar practice is being extensively adopted wherever fine sand can be conveniently procured. It is used as bedding for both horses and cattle, and is found to answer extremely well, being much neater than muck, and cheaper than straw. Animals lying upon sand are much less liable to attacks of lice, or of skin diseases, than when supplied with beds of litter of any kind. It furnishes the best possible material for horses to stand upon, because it does not tread down like clay, muck or loam, and consequently affords some pressure upon the frog. It is also an excellent conductor of heat, and keeps the feet cool; but, for this very reason, makes a cold bed, and working horses should have beds of straw.

Sawdust is also quite largely employed as bedding for stock, and an absorbent of liquid manures. It·has been said that chestnut sawdust contains an acid, which exerts a prejudicial effect upon the feet of horses, and dry sawdust of any kind must have a tendency to desiccate and heat them.

The highest health and comfort of a horse demand that he should be thoroughly cleaned every morning, whether worked or not, and after labor he should always be carefully dressed over before he is left for the night. It is no easy or simple thing to clean a horse well, and yet if done regularly and properly, it need not consume a great amount of time. The essential tools for the operation are a curry-comb or card, a good brush, a coarse comb for the mane and tail, a sweat-knife or scraper, a supply of old woollen and cotton cloths, for rubbers, plenty of hay or straw for wisps, a pick for cleaning the feet, and a large sponge for washing or wiping, to remove superfluous moisture.

In cleaning a horse, first select a suitable place—out of doors, if possible,—where there is room enough for the horse to turn without inconvenience, and hitch him in such a way that he cannot bite or strike any thing with his fore feet. Then proceed in a quiet and gentle manner to curry every part of his body, where he will allow it without much flinching, but be very cautious about the head, legs and flanks, and if the horse be very sensitive, these parts should be cleaned with the sponge, or with wisps and the brush.

Having thus given the skin a thorough scratching, and loosened the dandruff, proceed to remove it perfectly with the brush, and finally with a damp cloth. Next, comb out the mane and tail, being very careful not to break or pull out the hair. The mane will lie better, if smoothed with a wet brush. Now replace the blanket, laying it on a little forward of its place, and drawing it skilfully back so as to leave the hair perfectly smooth. This entire process will require but a few minutes labor from an active groom, provided the horse was properly cleaned the night before.

To dry off and dress a horse dripping with sweat, after violent exercise, is a much more laborious as well as important task. In the first place, such a horse should be immediately scraped with a piece of band iron, or a strip of hard wood brought to an edge. A convenient size for a scraper or sweat-knife is fifteen inches long by two inches wide and half an inch thick on the back. By this instrument a considerable amount of perspiration may be speedily removed, especially from the belly, to which it flows from other parts of the body. In mild, pleasant weather, the horse should be cooled down, and his circulation equalized, by leading him about, and then a blanket should be thrown over his body while his head and ears are rubbed dry; next, his legs should be wisped, wiped, and rubbed until clean, dry and warm; and finally, the blanket may be turned back, and the forward portion of the body dressed, and then, the blanket being replaced over the fore quarter, the remainder may be cleaned. Now remove the wet blanket, smooth the whole horse, and put on a dry cover, sufficiently thick to prevent him from becoming chilled. In a very hot day the first blanket may not be necessary, if the operation be expeditiously performed, but in cold weather the horse should be covered as soon as he arrives at the stable, and while walking about, and every precaution must be adopted to prevent a sudden chill. If it be very cold or stormy, so as to prevent the walking exercise, the horse must be covered very thoroughly and dried by hand as rapidly as possible. This is a tedious operation, but absolutely necessary, if the horse be a valuable one, and you would not have him stiffened.

Cold water should never be applied to any part of the body of a hot and exhausted horse, but warm water may be used to wash the legs, provided they be rubbed dry immediately.

It is an excellent practice to rub the legs of fast-trotting horses by passing the hands lightly up and down the limb so as to produce a gentle friction and increase the circulation, but if too much pressure be applied, the tendons will become sore, especially in cold weather. Hand rubbing of the legs is particularly refreshing to weary horses, and tends greatly to the preservation of their soundness.

In regard to the clothing of horses, there is much diversity of opinion. It is, however, absolutely necessary to cover warmly and protect from the cold such horses as are driven so rapidly as to cause profuse perspiration. Horses of slow work and coarse blood are generally furnished with a very thick, warm coat of hair, and readily become accustomed to endure the cold without a blanket. A horse, however, looks much better and requires less food when blanketed, and considering the variableness and severity of our climate, the use of some artificial covering is, on the whole, to be recommended.

Whenever a horse is cleaned, a careful groom will inspect his feet to see that his shoes are tight, that there are no projecting clinches to wound his fetlocks, and that there be nothing wedged into the foot between the heels of the shoe, or between the shoe and the frog, which would do injury to the sole of the foot. He will also with his pick (which is simply a short piece of iron, with a thin, pointed hook upon one end,) thoroughly clean out the gravel and dirt lodged between the shoe and the sole, and examine the sides and cleft of the frog to be sure it is all right.

The feet of well-bred horses, kept constantly in the stable, would become unnaturally dry, hard and contracted, unless some means were taken to moisten and soften them. The best method of doing this is to fasten into the foot by strips of thin hoop-iron, pieces of thick felt cut to fit the inside of the shoe, and cover the entire sole. These pieces of felt (or they may be made of several thicknesses of woollen cloth) are wet and laid into the foot and the strips of iron pressed in between the shoe and the felt. Sometimes the feet are "stopped" or filled with oil-cake meal, or with cow-dung, or with clay, but the same result is more conveniently attained by the first method. In dry, hot weather, fast-working horses unless they have flat feet and weak soles should have the feet stuffed every night.

It is thought by many to be an excellent plan to apply occasionally to all parts of the feet of horses an ointment consisting of equal parts of tar, lard, and beeswax, and it is probable that the hoof thus protected dries less rapidly and is rendered less brittle.

Finally, the good groom will see to it that his horse is so fed and exercised as to be in the best possible condition for his work. Neither horses nor men can be preserved in perfect health, without sunshine, fresh air, and exercise, and many fine animals are ruined by irregular work upon highly stimulating food. Whenever a horse is not employed in his usual daily task, he should be exercised at a slow pace by his groom, or at least be allowed to run for an hour or two in a clean, roomy yard. By standing day after day in his stable, the horse accumulates fat, his blood becomes heated and impure, and his tendons and muscles soft and unfit for violent exertion. At the same time, he becomes restive for want of exercise, and with his belly full of food is exceedingly liable to injure himself whenever he is taken out, even though he have a driver sufficiently careful to restrain him, which is not often the case.

In this country, it is customary to feed horses three times during the day, and in most cases it is better to give a feed of grain or roots at noon than to omit it. The stomach of the horse is small, and in a natural state he eats the greater part of the time, laying down but seldom except a few hours at night, and requiring but little sleep. In domestication, however, he receives more concentrated food and needs less time for eating; and he exercises more and consequently demands more repose. Horses which perform irregular, light work, like those employed by physicians may be kept in excellent condition if properly fed morning and evening; but those which engage in constant severe labor for several hours after the food has passed from the stomach, are very apt to eat too greedily when fed, and to have attacks of colic and other disorders of the digestive system.

The amount and kind of food given to a horse should correspond somewhat to the work required of him, and yet he must eat though he do nothing. Coarse, hardy horses may live, and work after a sort, upon hay and grass, but high-bred animals will scarcely subsist upon such bulky innutritious food, and of course should never be expected to do any thing more. It is now generally conceded that valuable horses ought to receive some grain or roots every day, whether at work or not, as it is well known that it requires careful training for several months, to restore a horse, which has been running in pasture for some weeks, to condition. Still it must be remembered that a horse can no more be kept in perfect trim for the fastest work all the time, than a bow can always be bent without losing its elasticity. The importance of occasional relaxation from hard labor for both man and horse is too often overlooked or postponed, until disease renders it indispensable. With a proper regard to variety in food and to the real health and ability of the animal, now frequently neglected, so long as the daily work is done, the horse would not only look and feel much better, but last much longer in complete soundness than he now does.

Sudden changes from green food to dry, or the contrary, must be made with great caution, and there is more need of mentioning it in this country because fortunately the almost universal English habit of giving physic to horses once, twice, or three times when such changes are made, is nearly unknown here. In most cases, simple loosening of the bowels by means of bran mashes and changing the food gradually, will be sufficient to prevent injury to the horse, provided he be exercised prudently after being sometime at grass. The rapid drying up of his fluids by the use of hard food, the heating of his legs and feet in the stable, and the relaxed condition of his joints and muscles, all render him very liable to inflammations and strains at this time.

The preparation of fast trotters or roadsters for matches, or for rapid driving, consists in removing superfluous fat, which obstructs the action of the lungs and heart and increases the weight; and in hardening the muscles and tendons. The principal means to be relied on, are physic, sweating, exercise, rubbing, and hard food of the best quality.

TRAINING.

By training is meant the preparation of a horse for the performance of such labor as will thoroughly test his speed and bottom. It consists in removing from his system superfluous juices and fat which obstruct the action of his lungs and heart and increase his weight, without adding to his strength; also, in imparting solidity and elasticity to his muscles, and firmness and endurance to his joints, ligaments and tendons. Another most important duty of the trainer, especially of the trotting horse, is to teach him the proper manner of doing his work, and, by judicious practice, to render him as fleet and reliable as possible.

The amount of time and labor bestowed upon a Thoroughbred horse in fitting him for a race is very great, and would entirely unfit a coarser animal for any considerable exertion. The average time occupied is six months, and is divided into three courses or preparations, which are each preceded by physic and a few days' rest.

The principal feature of the first preparation is the walking exercise, continued for two or three hours every day for six weeks, the object being to improve the appetite and season the bones, sinews, ligaments, heart and lungs, and fit them to undergo violent exercise.

After two weeks of this training, the first sweat is usually given, by enveloping the horse in blankets and hoods and galloping two or three miles. He is scraped and dried as speedily as possible, one boy working upon his head and two upon either side, and then he is covered, as usual, and walked about until perfectly cool. By the character of the perspiration the condition of the horse may be accurately determined. At first, it will be thick, lathery and profuse, but when the horse is fit to run it will be thin, watery and scanty. These sweats are repeated every fortnight during the first preparation, and once a week during the remainder of the training.

When the horse appears lively after a sweat or gallop, and feeds well, and has no unusual heat about his legs and feet, it is an evidence that he is improving and will bear more work. If, however, he is upset by these operations, he must have rest and a bran mash, or a mild dose of physic to put him in place again.

Horses in training are commonly fed two quarts of oats, old and perfectly free from dust, early in the morning, with an equal quantity of water, which should be pure and soft. After exercise and cleaning, at about eleven o'clock they are fed two quarts more of oats and watered ; at three o'clock they receive another feed of the same sort, and at night another, to which is added six or eight pounds of the best, old hay.

In the second preparation the horse receives two quarts more of oats, more frequent sweats, and galloping instead of walking exercise. The distance is usually four miles, and the speed is regulated by the trainer, according to the ability of the horse. The two objects to be kept in view at this stage are, first, to get rid of offending and useless matter, by thorough sweats, and, secondly, by exercise, to improve the wind, impart firmness and elasticity to the muscles, and accustom the horse to use his powers in the best manner.

The greatest danger now is that the legs may become inflamed, or break down from excessive galloping, and much attention therefore is given to them. They are hand-rubbed at least fifteen minutes each, every day, and, if necessary, bandaged; and if the horse cannot bear galloping at all times, he must be allowed to walk during his exercise.

In the final preparation two quarts more of oats, with a quart of split beans, or of Indian meal may be allowed the horse, and he must be galloped with special reference to the proper performance of his work, so that he may extend himself in a steady, regular manner, at the top of his speed, and acquire the power of staying the distance which must be run in the race.

To put a Thoroughbred horse in perfect condition requires much judgment on the part of the trainer, and attention to many points not even alluded to in these general directions; and the object in giving them is simply to exhibit the principles in accordance with which the work must be accomplished.

Only the Thoroughbred horse will continue to train on, constantly improving for several months, and ordinary horses in good health and fair condition can be fitted to do all they are capable of in a few weeks of special preparation. Of course, horses which have become much reduced in strength will require much more time. Thus breeding mares will not recover their full power and perfect form in less than six months after they stop suckling, nor even then unless they have been well kept.

To fit a match trotter to make his fastest time, it is necessary to bestow upon him just that amount of training, by means of physic or mashes, sweats, walking and trotting exercise, and nutritious food, which will bring him to the highest possible condition, without getting him sore or off his feed; and not less important is that practice and education in the pace itself which only a skilful driver can give, and without which condition is useless.

It is the distinguishing excellence of the American trotter, not merely to make time, but to trot squarely and evenly, moving his legs in true trotting rhythm. In no other country can be found horses capable of trotting a mile in less than two and one-half minutes, and nowhere else such absolutely perfect trotters as Ethan Allen. The greatest difficulty in the training of trotters is the tendency manifested by most horses, and especially those containing much thorough blood, to go in an irregular or mixed trot, when urged to the top of their speed, which has doubtless given rise to the opinion of many foreigners that the fast trot is the false or unnatural gait. However applicable this remark may be to most horses especially in other countries, it is certain that some horses are natural trotters from their peculiar structure, which is the result of the cultivation of this pace in their progenitors, often for several generations. Even while sucking colts, they will frequently exhibit the square, open, long-reaching stride which marks the genuine trotter, and after years of good driving and practice, they can trot faster than they can gallop.

While Thoroughbred horses rarely bend the fore leg sufficiently in trotting, others, and especially the Canadian, throw up the knee in an unsightly and useless manner, wasting power, and appearing to move faster than they actually do. They are often quick and stout, and as they are low and sloping behind and heavy forward, they seem striving to go *up* rather than onwards, and are not inappropriately said to "climb."

Other horses instead of spreading their hind legs and carrying both hind feet past the outside of their fore legs in a symmetrical manner, acquire the awkward habit of throwing one of them between their fore legs, and therefore are neither square nor level trotters, and are very liable to overreach, or cut the heels or quarters of the fore feet with the hind shoes. These horses are said to "hitch," and many do it in such a way that they seem to trot forward and gallop behind, and spirited trotters are frequently forced to this gate by fast driving with a heavy load. The celebrated Orloff trotters of Russia are said to go with astonishing swiftness at this trotting gallop, sometimes making fifteen to twenty miles an hour on the road.

Again, many very fleet horses when overdriven, adopt a disagreeable gait, which seems to be a cross between a pace and a trot in which the two legs of one side are raised almost but not quite simultaneously. Such horses are said to "single," or to be "single footed."

When a trotter in rapid motion becomes weary, or overexcited, or loses his step or balance from any cause, he usually begins to gallop, or in technical language he "flies up" or "breaks up." The principal point in the art of driving, which so few acquire in perfection is this, namely: to keep the horse at the top of his pace without crowding him off his legs, and next in importance is the power of quickly bringing him down to his trot again after an unavoidable break.

Young horses should rarely be urged to a break, and if they show the least inclination to hitch or single they must be kept back to a trot which they can perform correctly. The gait of many naturally fine trotters is ruined by too much haste and harshness in training. Horses should not be put to severe work in trotting before six years of age, and do not arrive at their greatest speed before they are ten or twelve. Flora Temple in her first match on the Union Course, when five years old, trotted the mile in two minutes and forty-nine seconds; when eight years old she trotted in two twenty-seven; when eleven years old in two twenty-four and a half, and when fifteen years old she astonished the world by trotting a full mile at Kalamazoo, Michigan, in two minutes nineteen and three-quarters seconds.

It has been affirmed, though probably without sufficient reason, that the colts of old mares are more likely to be fast trotters than those of younger ones. The dam of Flora was five years of age when she produced the "phenomenon" of the trotting track, and although still breeding on the farm of Mr. Alexander of Kentucky, has not yet produced the equal of her first born.

While it is desirable that fast trotters should bear somewhat upon the bit, they should not be allowed to draw the load with the reins, because they not only exhaust themselves and their drivers unnecessarily, but are very apt to be choked by having the jowls drawn back against the neck. So much apparent aid, however, do many trotters receive from a stiff, steady pull upon the bit, that they seem to be thus enabled to trot much more evenly and rapidly than they otherwise could. To what extent this reliance upon the driver is a mere useless habit, it is difficult to decide; still it should be recollected that even the galloping racer requires to be "held together" by his jockey rider, and the trotter at high speed certainly needs it much more from the peculiar character of his gait.

Although three minute trotters are now so numerous, it is only about forty years since a match against time was made with a wager of one thousand dollars, that no horse could be produced which could trot a mile in three minutes. A Massachusetts horse, called Boston Blue won the money and the honor in 1818.

SHOEING.

It is unnecessary here to describe minutely the structure of the horse's foot or to give complete directions for fitting and fastening on a shoe. Nevertheless, since injury to the feet, whether from neglect or bad treatment, is ruinous to the horse, it seems desirable to make a few suggestions upon this very important matter.

Mr. William Miles, in his excellent essay on this subject, republished and distributed gratuitously by the Massachusetts Society for the Promotion of Agriculture, gives the following reasons why his horses always had good feet: "First, they are all shod with few nails, so placed in the shoe as to permit the foot to expand every time they move; secondly, they all live in boxes instead of stalls, and can move whenever they please; thirdly, they have two hours daily walking exercise, when they are not at work; and fourthly, they are never tied in the stable." To these four he should have added the following: fifthly, their feet are never washed when they come in from work, but are nicely cleaned with the pick and brush; sixthly, they are never allowed to become dry and hard, but are stopped with cow-dung every night, and covered for a few hours every morning with a wet swab or piece of thick felt buckled around the foot; and finally, they are smeared every morning with a preparation formed by melting together lard, honey, tar, beeswax and glycerine.

The essential points to be regarded in shoeing a horse are few and simple. In the first place, the foot should be pared down so as to remove all superfluous horn, and leave a smooth and level surface to receive the shoe. Those feet which are at all inclined to be high and narrow, should be well cut down at the heel, but flat feet will not bear it, and do not need it. With regard to the sole of the foot, the best authorities differ; but it seems, on the whole, advisable, for the most part, to let it alone, as it greatly protects the internal parts of the foot from bruises and from sudden variations of temperature, and will dry less rapidly when thick. Of course it must be cut away sufficiently to prevent it from receiving any pressure from the shoe, which must, however, be "seated" to avoid this and make it possible to pass the point of the pick between the sole and the shoe.

The ragged portions of the frog should be trimmed off, but the substance of it should never be unnecessarily diminished, as it is very properly called the "life of the foot." The appearance of the frog affords a most reliable evidence respecting the past and present health of the horse's foot.

The next step is the selection of a proper shoe and fitting it to the foot, and this requires judgment and mechanical skill on the part of the shoer. The web of the shoe should be thick or thin, narrow or wide, according to the form of the foot, the work of the horse and the character of the roads.

The feet of Arabian horses are proverbially good, and they are shod with a plate of iron covering the entire sole and frog, except a small hole in the centre of the shoe. This protects the whole foot, and probably is beneficial by bringing some pressure upon the frog, which is adapted by nature to receive it.

The outer edge of the shoe should exactly fit the foot, whatever its shape, except at the heels, where it may be suffered to project very slightly to allow room for the hoof to expand when weight is thrown upon it in going. Spreading the heels of a shoe can have no effect in expanding the foot, as is sometimes imagined. If there were no danger that the horse would step on them, it might perhaps be of service to narrow-heeled horses to spread the shoes somewhat, and thus furnish a broader base of support for the foot, especially where high corks are used. Still it is better as a general rule to adhere to the form of the foot as the guide to the proper form of the shoe.

The great secret of good shoeing consists in so fitting the shoe to the bottom of the foot that it bears equally upon every part of the crust, and this ought always to be perfectly done before a nail is driven. The practice of applying the hot shoe to the hoof is not to be commended, and it should never be held on the foot for a moment, but it is the only means by which an ordinary smith can get a perfect fit, which is indispensable.

There should be a smooth, level space upon the foot-surface of the shoe, from quarter to half an inch wide for the crust to rest upon, and it is especially important that this portion be absolutely level at the heels, so that they may expand and contract readily. Careless and ignorant workmen often leave this part of the shoe inclined inward, so as to prevent entirely the the natural expansion of the hoof. Others, on the contrary, are so excessively knowing as to make the inclination outwards, so as to produce an abnormal expansion by a sort of wedge forced into the foot at every step of the horse. It is certain that no foot can either be prevented from contraction or cured of it by any mechanical process. The disease, where it exists, is within the foot, and the hoof will not be larger than the parts it covers.

There should be from five to seven nail-holes in each shoe, two or three of them upon the inside of the toe, and the others upon the outside, extending back two-thirds of the way to the heel. The holes should pass straight through the shoe, and be sufficiently large to admit the nail freely, and the fuller or groove in which the holes are made, should be wide enough to receive the heads of the nails.

Horses with flat or tender feet will go much better, especially upon pavements and frozen or stony roads, if a piece of leather or vulcanized rubber be placed between the shoe and the foot. Before this is done, the sole should be smeared with tar and stuffed with oakum, so as to fill the concavity of the foot upon either side of the frog.

In fastening on the shoe, the nails should be driven straight through the shoe, and thus prevented from passing up the side of the hoof, as is too often the case. The lower part of the shell of the foot is thicker, and tougher, and consequently holds the nail much better than the middle or upper portion, and there is also great danger of pricking the sensitive part of the foot, when the nails are so driven that only the point comes out of the horn. The clinches should always be made in the stoutest part of the nail, and neatly buried in the hoof, with the hammer, and never afterwards weakened by filing. Indeed the rasp should very rarely be used upon the foot, after the shoe is on, except at the toe, and it should never be applied above the clinches.

The shoes of horses at work should be carefully examined every day to see that they are neither loose nor in any way out of place; and they ought to be reset or renewed at least once in two months, and upon valuable horses with good feet, once a month, whether they become loose or not. Upon flat and weak-footed horses, there is little danger that they will remain fast long enough to do any injury, and in such cases, they may safely be allowed to go unchanged, if they will, the full eight weeks.

Horses running in pasture may be suffered to be without shoes, if their feet are strong, but it is much safer to put tips or short shoes upon their toes, to prevent the hoof from being broken. The feet of unshod colts should be pared down as often as they need it, since if neglected, they may become permanently misshapen, and the unnatural strain upon the pastern, caused by the excessive length of the toe, is very apt to produce ringbone.

EDUCATION OF HORSES.

Horses, like men, may be wonderfully improved by a good education, being rendered more gentle, affectionate, intelligent and useful, and thus in every respect more valuable. There is, however, a very great difference in the intelligence and temper of horses, some being quick of comprehension and others excessively stupid—some pleasant and willing under all circumstances and others as constantly ill-tempered and perverse. These mental and moral characteristics are generally expressed in the countenance and features of the horse as unmistakably as in those of a man, and persons who have never given attention to the physiognomy of horses will be surprised to observe the very obvious differences apparent even among those of the same breed. To a few individuals only seems to be given the privilege of reading with almost unerring skill by some natural faculty the characters of men and horses as depicted upon their countenances. It has been said, doubtless with much truth, that Mr. John S. Rarey, the famous horse-breaker, was familiar with every thought and feeling of which a horse was capable, and that this knowledge, resulting in part from his extensive experience and still more from his natural insight into the character of the horse, was the principal cause of his astonishing boldness and marvellous success. If there be any talent born in the man, it is the faculty to govern and to teach, and hence really excellent instructors are by no means numerous. There are two very unlike kinds of government—the one common to men and beasts, and which may be called the government of brute force or of fear, and the other practiced by those intelligent and humane individuals who are able to appreciate and apply it, and which may be called the government of kindness. Among animals the stoutest and fiercest bear undisputed sway over their weaker companions, simply because they are sure to inflict bodily injury upon all offenders; and the same principle is commonly employed by men in the discipline and training of both human beings and dumb beasts. If the sailor, or soldier, or school-boy, or child is disobedient, severe corporal punishment is the almost universal consequence with very slight regard to the circumstances which may have attended the commission of the fault. In the same way horses, oxen and other domestic animals are habitually flogged and abused without the least consideration of causes or results. Consequently, they have neither love for, nor confidence in, their masters, and instead of laboring with a cheerful spirit to the best advantage, they become either stupid, spiritless drudges, or nervous and unmanageable machines, or finally revengeful, fighting brutes, disposed to do as little good and as much harm as possible.

In the government of kindness it may be necessary to resort to severe measures in special cases, but instead of incessant threatening and whipping by which all the worst passions are aroused, habitual and ready obedience is secured by rational means. In the management of animals and young children, a correct method is even more important than in the case of men, because they are incapable of reasoning upon the subject, and therefore of inferring or supplying any thing which may be omitted in the instructions. They are also unable to understand the meaning of language, and of course should be dealt with very patiently. The instructor should be very careful to teach but one thing at a time, and to employ no harsh words nor punishment until quite certain that his pupil comprehends distinctly the thing required and is able to perform it.

The first step in the education of any animal is to gain his confidence, so that he has no wildness through fear that he may be injured. When young, all animals are easily tamed by gentle treatment, handling and feeding with such things as they particularly fancy. The young of domesticated animals are much less inclined to be suspicious of man than those of wild animals, and if properly treated would never need any training. But it often happens that colts, for example, are never handled until old enough to break, and are therefore afraid of almost every thing; and the first, most troublesome, and most important part of their education, is to secure their entire confidence, and this should be accomplished in the kindest and most quiet manner possible.

The common expression, "breaking a colt," has obvious reference to a very different practice from that to be recommended in this chapter. Instead of attempting to allay the natural alarm of the wild colt, the usual method is to secure him with a rope after an exciting chase, and permit him to pull and plunge until the fastening gives way, his neck breaks, or he becomes so exhausted as to give up the contest for the time. Then a reckless rider mounts him with whip and spur, rendering him almost frantic with fear and torture. After a violent struggle, in which perhaps he throws his rider and very likely himself, he is relieved of this torment to undergo another. He is enveloped in a harness as in a net and securely attached to a wagon, with one or two men at his head and one holding the reins. He knows nothing of the object in thus entangling him, and has no confidence in man, and being ignorant of bits and collars and horse-talk, when told to go of course does not obey; then he is whipped for his stupidity in not understanding English, which is taken for obstinacy; then he attempts to rush forward, but is checked by a violent pull on the bit, and in his despair either runs back and throws himself down and is forever after balky, or kicks and clears himself, which he will never forget, or makes another more desperate struggle to go forward, becomes regardless of the bit, and runs away either quite unmanageable or is stopped after being worried out with fright and exertion. After these lessons, if he be a colt of high spirit, he will shy and start at many strange objects for which being flogged he will always associate the frightful objects and the flogging as necessarily connected, and be more frightened than before. If poorly kept and worked regularly, an ordinary, good-tempered colt will in time become a tolerably safe and useful horse even with such an education, but very spirited and plucky animals are almost sure to acquire some dangerous or troublesome vices.

This system of breaking colts is founded upon the government of brute force or fear, and has been in use in various forms from the earliest times. The horse is subdued at the present time in different countries by various means on this same general plan.

Horses and other animals may be completely subdued by choking, starvation, bleeding, physic, want of sleep, violent exercise, pain, or any other means by which their strength and courage are destroyed, so that they can make little or no resistance.

In Chili, horses are exhausted and subdued by worrying them constantly in the stall until they lie down in despair or fall down from weakness, which will generally happen in about forty-eight hours. They are then saddled or harnessed, and if refractory, the cruel process is continued until they become gentle.

On the pampas of South America wild horses are caught with the lasso, thrown to the ground, saddled and bridled, and ridden with whip and spur until completely exhausted and perfectly submissive. The long hair of their tails is then squared off with a knife to indicate that they are broken, and they are again turned loose. This method of riding a horse quiet was adopted by Alexander in breaking Bucephalus, and with slight variations is now employed in Australia, in Mexico, and among the Indians of North America. Some of the latter are said to have the custom of breathing into the nostrils of the horse while prostrate upon the ground, or so hobbled as to be in a helpless condition, with the idea that it inspires him with confidence.

It is well known that a horse always endeavors to touch every object new and strange to him with his nose, and this has led to the opinion that he is peculiarly affected by the odor of things about him. This is, however, a mistake, as the horse employs his nose, which is very sensitive and covered with long hairs or feelers, principally for examining objects by the sense of feeling, since he is not favored with a sensitive hand, or foot, or proboscis.

Many impostors have pretended that by the use of certain odoriferous substances they could gain a complete mastery over the horse. Among the articles recommended for their facinating power are the excrescences found on the inside of the horses' legs which are to be pulverized and blown into the nostrils; the sweat of the arm-pits upon the hands of the operator, or certain volatile oils, as the oils of rhodium, or of origanum.

It is perfectly absurd to suppose that any such substances can produce any decided or desirable effect upon the horse, either in taming or in educating him, and many of those who have employed them with apparent success, have confessed that they did so only to deceive, and really derived no benefit from their use.

It is a well-established fact that no animal, unless frantic with pain or rage, will venture to attack a perfectly fearless man who has the opportunity of fixing his eyes steadily upon those of his opponent. This superiority of man is the result merely of the courage which he exhibits because of his greater intelligence and his ability to rely upon weapons of his invention. When one animal finds himself suddenly in the presence of another fierce and powerful one, he does not stop to deliberate, but immediately rushes to the conflict, or retreats in haste, while his enemy takes the opposite course with as little delay. But when he confronts a man who knows that his safety depends upon his standing unmoved, or who relies upon some artificial means of defense, the animal is amazed at his boldness, hesitates to begin the attack, and soon slinks away in fear. This calm courage so remarkably possessed by Mr. Rarey, enables him successfully to encounter with no other means of defense than a small whip, and thoroughly to subjugate with the aid of a few straps such ferocious brutes as Stafford, Cruiser and Peacock.

Before proceeding to describe the method of treatment best adapted to render a colt, or a wild or vicious horse gentle and tractable, it is but just to acknowledge the credit due to the most famous and absolutely invincible horse-breaker, to whom the world is indebted for the only thoroughly rational and universally applicable system of horse-education.

With these preliminary remarks, we will now endeavor to describe the best method of educating young horses, and of subduing and managing those which have acquired dangerous or disagreeable habits.

If possible, the colt, from the very first, should be rendered perfectly gentle and fearless by frequent handling of all parts of his body and the kindest treatment. When a few weeks old, he should be halter-broken. This is an important part of the breaking in of the horse, at whatever age undertaken, and should be accomplished thoroughly, and yet without violence. The halter should be of leather, and well fitted to the head, so as not to cause any unnecessary pain. The most objectionable of all halters is the common one of rope, with a running noose about the nose. This is unfit for any horse, and especially for a young one, and many horses have become addicted to the exceedingly annoying trick of pulling on the halter by its use. The common practice of hitching a colt to a post and letting him pull until he learns that he cannot get loose, is unsafe and unkind, as he becomes frightened and angry, and sometimes injures himself. Neither should he be suffered to drag a man at the end of the halter, and throw himself down and exhaust himself in struggles for liberty. In these ways he learns how to pull, and how stout he is in comparison with a man, two things he should never know.

In the first place, put the halter upon the colt any time after he is six weeks old, and let him become accustomed to it. Then in a stable or small yard, alone and very quietly, take hold of the halter near his head, and turn him short around, first one way and then the other, but do not allow him to pull either forward or backward with much force. If he should strive to get away, yield somewhat until he learns that he is expected to obey a slight pull upon the head, and that he is not to be injured because deprived of freedom. Do not use any blows or loud words, but rather gentle patting and coaxing, which may be employed to great advantage throughout the education of the colt. It is also an excellent practice to reward and gratify him, when old enough, by a handful of oats, an apple, or potatoe, or piece of carrot. There is no better way of soothing the ruffled feelings, imparting confidence or allaying anger, than this.

After the colt has learned to follow the halter in the stable, or yard, lead him about in some quiet place, and if he will not go, do not undertake to drag him, nor whip him, but turn him round and round, which he cannot resist, until he chooses to move along in the direction you wish to take, and do not become impatient, even though you are compelled to wait some time before he will enter the stable door, pass through a gate or step over bars.

Not until he leads well, should you venture to hitch him, and then, with much caution. It is best, perhaps, first to tie him in the centre of a wide stall, with some thing to eat before him; and, if convenient, a partition or rope behind him to prevent a straight pull backwards, if he should be inclined to try one. After this he may be fastened in a quiet place out of doors, and will very seldom endeavor to break loose.

If, however, a colt or horse should acquire the habit of pulling at the halter, and throwing himself down if unable to get away, there are many remedies proposed, of which the following are perhaps the best.

First, throw a rope fifteen or twenty feet long over the limb of a tree, ten or twelve feet from the ground, and attach a heavy stone or other weight to one end. Now hitch the pulling horse to the other end, and when he pulls he will raise the stone from the ground, and be able to step backward until the disagreeable weight hauling up his nose, persuades him again to approach the tree. After pulling awhile at the yielding, but unconquerable stone, many horses become quite disheartened, and abandon the vicious habit.

Secondly, fasten the horse in a stall with a halter about four feet long, and attach securely to his hind pasterns a rope, which should be tied to the manger in front of the horse, so short that when he steps back to pull, the rope upon his feet receives the strain instead of the halter, and he unexpectedly finds himself seated upon his rump.

Thirdly, with otherwise incorrigible horses, the cold bath may be tried, by fastening the puller to a post upon the bank of a deep river or pond, so that when he pulls it shall go towards the water. As soon as the horse begins a vigorous pull, let go the fastening, and thus precipitate him into the harmless liquid.

This vice is often a difficult one to cure, as some horses seem to be almost insane with fear at finding themselves fastened, and can never be left with safety, unless so securely tied that they cannot possibly break loose. Still, with judicious treatment, almost all can be induced to refrain from the practice. It is, however, much better and easier to halter-break colts so that they will not pull, than to make them relinquish the habit after it has been acquired.

The sucking colt is usually weaned about four months of age, and will then very gladly receive attentions from his master. He should be fed from the hand, and may easily be taught a variety of amusing tricks, which will have the two-fold advantage of keeping up an interest in the colt and securing better care for him, and of rendering him intelligent, fearless and affectionate. Among the numerous tricks commonly taught to learned ponies, exhibited in circuses, perhaps the following are best adapted for general use in the education of colts, namely: to come when called, to lie down, to roll over, to sit up, to shake hands, to make a bow, and to circle, that is to walk, trot or gallop in a circle, and to turn as commanded.

In teaching a colt to do these tricks, it is best to give him one or two lessons, of half an hour each, every day, and he will pay better attention, and appreciate your gifts of food more, if he have an empty stomach. Early in the morning, before he is fed, is the most favorable time. Begin with simple things, and repeat all the tricks in the same order at each lesson, until they are familiar. Constantly reiterate the commands in the same form so that he may understand them perfectly, and always employ persuasion instead of force until your pupil becomes acquainted with his lessons, after which he may be compelled to obey.

To come when called.—After a colt has been well broken to the halter he may be taught to follow, or to approach his master when told to do so, in the following manner.

Attach a small cord twelve or fifteen feet in length to his halter or bit, and lead him into the training inclosure, which may be a barn floor, or a small yard with a tight, high fence. Then, holding the cord in the left hand, and a long straight whip in the right, step in front of the colt about six feet from him, and say, "Come here, Charley," or whatever his name may be, at the same time switching his fore-legs lightly to induce a start. Draw him to you gently by the cord, and then pat him on the forehead, and reward him with a piece of bread, a handful of oats, or something of the kind. Repeat this practice until he will come quickly, though distant the whole length of the cord. After a few lessons, the halter may be removed, and he will readily obey the order when given, or come at the crack of the whip. As soon as he has learned to have implicit confidence in you, and to feel assured that you not only will not injure him, but will reward him for quick obedience, he may be taken into an open field or the highway, and will soon learn to come when called as certainly as a dog.

This is an easy, but important trick, because it is readily understood by the colt, and will furnish a good means of determining whether he has acquired the willingness and confidence necessary in his subsequent education. Be very cautious about the use of the whip, or of harsh language, and remember that perfect, cheerful obedience is your object, and that it can only be secured by great patience and gentleness.

To lie down.—Having the colt in the yard, with his bridle on, take hold of the rein near the bit with your left hand, raise his nigh fore-foot with your right hand. Now repeat the words, "Lie down, sir," and gently draw his fore-foot back towards his hind feet, and his head downwards and backwards. Whenever he becomes uneasy or weary, and turns around or straightens up, let him have his own way; but as soon as he permit, renew the attempt as before, commanding him constantly to "Lie down." He will, after a while, either lie down of his own accord, or allow you to push him over gently with your shoulder. While he is down feed and caress him until he becomes perfectly quiet, and seems to be rested. Repeat this operation twice every day, until the colt will lie down as soon as told to do so, provided you pull down his head and gently tap his fore-leg.

After this he will readily learn with a little practice to obey the command only.

If the colt be obstinate, he may be forced to lie down by strapping up his nigh fore-leg, and fastening a strap or rope around the pastern of the off fore-leg; then holding firmly by the bit with the left hand, crowd against the colt with your shoulder so as to compel him to step, and then pull up with your right hand the off fore-foot, so as to bring him upon his knees. This is a very uncomfortable position, and he will soon either lie down himself, or suffer you to push him over. Then feed and pat him, and after he appears calm allow him to get up. Repeat this every day, until he will obey the word of command, which should be constantly reiterated during the progress of the lesson.

It is sometimes desirable to hold a horse down, and this may be easily done by stepping on his mane with one foot, and turning his nose upward, since in this way he is prevented from getting any of his feet under him.

Most horses may be kept down by placing the knee upon the withers and pulling the nose up towards the same point. Of course for the performance of painful operations, it will be necessary to bind the feet in addition to the above.

To roll over.—When the colt will lie down willingly, he may be taught to roll over as often as told to do so, by taking hold of his fore and hind feet, and turning him over as many times as may be necessary, repeating every time the command, "Roll over, sir."

To sit up.—The horse, in rising from a recumbent position, first turns on to his belly, throws out his fore-feet, and raising himself on them, springs forward and rises on his hind feet.

To teach a colt to sit up like a dog, take him into the yard and make him lie down. With the aid of a rein over his neck compel him to turn on to his belly, and then stretch out his fore feet in front of him. Tell him to sit up, and as he rises on his fore feet stop him in the desired position by means of the reins. Retain him in a sitting posture but a few moments, caressing, feeding, and patting him as much as possible. After a few repetitions he will assume the attitude as soon as told to do so.

If the colt be not very tractable, you can compel him to sit up by passing a rope over his neck between his fore-legs and then around his off hind fetlock. Taking a firm hold of the end of the rope with your right hand and thus drawing the hind foot of the colt forward, you can prevent the possibility of his rising without your permission. In very difficult cases this rope may be held by an assistant, though as a general rule, it is much better to operate entirely alone.

To shake hands.—In teaching the colt this and many of the following tricks, the training yard will be found the most convenient place.

Place yourself directly before the colt, and reach out your hand for his foot, at the same time hitting him gently on the fore-leg with your whip. He will soon begin to step or paw, and then you are to take hold of his foot and bring it towards you, talking to him pleasantly the while, and rewarding him for his real or supposed obedience in the usual manner.

By a little practice, a colt may be easily trained to approach, make a bow, and shake hands, even without the use of halter or whip, which makes him appear both intelligent and polite.

To make a bow.—Place yourself before the colt in any convenient place, and make a low bow to him, saying, at the same time, "How are you, Charley?" or, "Good morning," or something of the sort. As you thus salute him, touch him on the breast with your whip, or a sharp stick. This will irritate him and cause him to nod his head in anger, or in endeavoring to bite the stick, or whatever touches him. This nod you are to accept as a bow, though not intended as such, and for this you must caress and reward him with some agreeable morsel. After a few lessons he will nod his head when saluted, without being touched.

To circle.—Take the colt into the yard, turn him loose, and start him walking around you. Then, after two or three circuits, say to him, "Turn, sir," at the same time stopping him with your whip. Now pat and feed him, and repeat as often as may be necessary, at different rates of speed, until he will circle at any required gait, and turn at the crack of the whip, or the word of command. You may now easily train him to perform this trick in the street, or elsewhere, without a halter.

Persons desiring further instructions for teaching colts or horses to perform a great number of curious, and some almost incredible feats, are referred to Dr. G. H. Sutherland, of De Kalb, New York, who possesses remarkable skill in the art of educating horses, whether for work or for play.

While the colt is young, he should also be made familiar with those things by which horses are most commonly frightened, because he is then more easily managed, will be rendered thereby habitually fearless and confident, and thus be better prepared for breaking to the harness and the saddle.

The method of preventing a horse from being frightened at certain objects by which he is always startled or is rendered unmanageable, is precisely the same in principle as that to be adopted with the colt. If, however, it be difficult or impossible to hold the horse tolerably still in the presence of the frightful object, it is necessary to take away his power of resistance, by strapping up his nigh fore-leg. This is done by winding a strap once or twice around the pastern, and then bending the leg so as to bring the foot close to the elbow, and buckling the strap snugly around the arm. Upon three legs most horses are perfectly controllable.

A horse will never fear that which he knows from careful examination and experience will not injure him. His first impulse upon hearing or seeing any thing strange, is to run from it. If, however, that be impossible, or if the sound be constant or often repeated, or if the alarming object remains unmoved, or frequently returns to view, he soon learns that he is unharmed, and acts accordingly. Thus almost all horses, with judicious treatment, soon become perfectly indifferent to the smoking, puffing, rattling, screaming monster, called a locomotive, which at first seems to them a most terrible combination of frightful sounds and sights. The following important principles are of constant application in the education of horses.

First. Any horse may be so educated as to do cheerfully any thing within his power.

Second. The supremacy of man over the horse is the result of his superior intelligence, which enables him to manage the horse in such a way that he cannot successfully oppose or contend with his master. Therefore the horse, if properly instructed, will never be conscious of his real ability to resist or thwart the wishes of man, because prevented by good treatment from attempting to exercise it, or by mechanical contrivances from using it advantageously when he undertakes to do so.

Third. The horse, having no reasoning faculty, imagines himself nearly helpless when rendered so in any part of his body. Hence the custom of sewing a vicious horse's ears together to make him quiet in shoeing, and the great advantage of strapping up the fore-leg, by which refractory horses may generally be made completely tractable.

Fourth. A horse once thoroughly subdued by any means seldom forgets it, especially if this be done as in the Rarey method, without the infliction of pain, and without exciting his fear or anger unnecessarily.

Fifth. A horse will be readily convinced that any frightful object is harmless, provided he be enabled or required to examine it thoroughly by *seeing*, *smelling*, and *feeling* it, especially with the nose or muzzle.

Sixth. The horse should learn to respect or fear, to obey, to love, and to feel confidence in his master.

Seventh. The whip should only be used to command attention, and to frighten the horse when doing wrong, or refusing to obey, and becomes worse than useless as soon as it arouses a disposition to fight or resist. Fear and anger never exist together in the horse, and the latter passion should never be excited if it can possibly be avoided.

Eighth. To educate horses in the best manner, a man should have complete control of his temper, and never exhibit in his countenance or voice either rage or anxiety.

In accordance with the fifth principle, the colt should be made familiar with the various objects likely to startle him in after life, by bringing him near to them in as gentle a manner as possible, and compelling him to rub his nose upon them, or stand near them until his fear is gone. For example, if the sight and smell of a robe a few feet distant alarm him, take him alone in the yard and lead him to the robe, and rub it upon his head and neck, and soon he will permit you to throw it on to his body, or over his head, or even to tie it to his tail, without the least appearance of fear.

To accustom a colt to a drum, proceed in a similar manner. Let him touch it with his nose, rub it against his neck and sides, and place it on his back. Then tap it lightly with the finger, and soon you may play upon it vigorously, even while it rests upon his back, and he will be quite indifferent.

To render a colt familiar with the sound of a gun, begin by snapping percussion caps, at the same time holding the colt by the halter loosely in the yard, and when he becomes accustomed to them, fire a pistol or a gun until he pays no attention to the report. Do not manifest any alarm by seizing hold of his head, as if you expected him to jump, but be as careless as possible, patting and feeding the colt between the shots, and he will soon permit you to shoot from his back. When you attempt this, appear as calm as ever, and do not gather up the reins and clutch his body with your legs just before you fire, because if you do he will certainly jump, whether your gun goes off or not.

In a similar manner, proceed with an umbrella and parasol, opening and shutting them close to the colt, rubbing them upon him, and holding them over his head and body till he cares nothing for them.

Then teach him that a newspaper, though it is white, and rustles, is a perfectly harmless article, by rubbing him with it, throwing it upon him like a blanket, dragging it about upon the ground by a string, and riding him with it in the hand.

To accustom him to the cars, lead him to the depot and permit him to see them at rest, and examine them with care, even to touching them. Then allow him to see them moving, and, at the same time, lead him about in the vicinity as if nothing important was being done.

When once you commence to familiarize a colt or horse to any thing which frightens him do not leave the work half done, but repeat the lessons patiently day after day, if need be, until he manifests no fear. Otherwise his terror will only be increased by the experiment and he will be rendered more frantic and unmanageable than before.

At any time after he is one year old, the colt may be bitted, or accustomed to the bit. This is done by putting on him a nicely fitting bridle with a thick snaffle or jointed bit about four and one half inches long. To the joint in the centre of the bit may be loosely attached some tags of iron an inch or so in length, which, resting upon the tongue, will cause the colt to champ the bit and prevent him from resting his head upon it as a dead weight. This bridle should be worn every day for an hour or two until he becomes acquainted with it. Then reins may be used to bring the head into a good position and teach the colt to give his mouth to the bit. These reins should never be buckled so tight as to cause pain from the unnatural attitude nor should they be fastened so as to hold the head in a constrained position more than from fifteen to thirty minutes at a time. A padded surcingle with a crupper and with straps from the back-strap at the hips to the sides of the surcingle, is the only bitting apparatus necessary, although a dumb jockey such as may be procured at the saddlers in cities is very convenient. To fetch up the head, a common check or bearing rein is needed, and to bring in the nose so as to make the face of the colt vertical, another pair of reins should pass from the bit to the sides of the surcingle upon which buckles may be fastened.

In order that a colt should carry a good head and neck the parts themselves must be rightly formed and the neck properly joined to sloping shoulders. The Thoroughbred horse surpasses all others in the form and carriage of these parts, and it is utterly useless to attempt to make a short, thick-necked, big-headed horse imitate the elegance and beauty of the perfectly formed animal. If he have spirit enough he may generally be made to carry his head up and his nose in, but always with an air of stiffness and awkwardness. Great care must be exercised not to choke horses with thick necks and heavy jowls with the throatlatch, because, although sufficiently loose when the head is free, it is often rendered painfully tight when the head is checked up and brought into place. The wind also of such horses is very liable to injury from the pressure upon the windpipe in the constrained position of the head.

The main object in bitting a colt should be to induce him to yield his nose to the pressure of the bit and to form what is technically called a good or fine mouth. The possession of such a mouth is one of the most desirable accomplishments either for a saddle or driving horse and one in which American horses are usually deficient. A well formed and properly bitted horse never needs martingales, which have a decided tendency to render the mouth of a horse insensible and unyielding and ought never to be used except upon hard-pulling trotters; and yet but few of our horses can be managed with any degree of comfort without them.

By the proper use of the curb-bit the head of the colt and of the older horse may often be brought into place when every other means proves unavailing. This bit may be used upon the horse while standing by his side, in the saddle or in driving, but requires much prudence and judgment on the part of the master. It must not be employed too severely nor too constantly, but so as to make the horse feel that he must obey and yet not so as to frighten or enrage him. The custom of driving with a curb-bit is much more prevalent in England than in this country, and very many American horses would be safer, pleasanter, and more beautiful if driven in this way.

In breaking the colt to the saddle, which should not be done before he is four years old, there will be very little trouble provided he has been educated according to the directions heretofore given. As soon as he is satisfied from examination that the saddle will not harm him remove the stirrups and place it upon his back. Do not girth it too tight at first, nor attempt to mount before he has become accustomed to it. Then lead him to a block eighteen inches high in the yard or barn floor and step on to the block, and at the same time talk to him and caress him. Then carefully put on the stirrups and placing the right hand over on to the off side of the saddle, bear your weight upon it and rise very quietly without a spring from the block into the saddle. If the colt has been properly tamed and you manage judiciously he will not need to be held while you mount, but will stand perfectly still. As soon as he is accustomed to your position and to the weight upon his back let him move about slowly in the inclosure and dismount and mount repeatedly. After two hours of this discipline you may ride him where you please, permitting him at first to go very quietly and slowly and not prolonging the lesson so as to weary and disgust him. Do not employ whip or spur or martingales, but simply turn him to the right or to the left if he be disinclined to go forward, or if he attempt to jump or rear and plunge to throw you off. Ride him at first upon the walk only, and teach him the pace to perfection requiring him to walk rapidly and truely without ambling or pacing. Then teach him to trot, and when he does this well you can easily make him canter. In this latter pace you can compel him to lead with the right or left foot by riding him in a circle first one way and then the other, and afterwards by pulling on one rein and urging forward the opposite side with the whip, spur or leg.

Colts which are expected to show great trotting speed should never be allowed to canter or gallop, but ordinary driving horses are in no way injured by being accustomed to canter under the saddle.

A colt may be broken to the harness at two, three, or four years of age, but should never be subjected to hard service before he is six years old. First, put on the harness in the yard and when he has no fear of it, hitch him beside a steady horse and lead him with the harness on. Then harness him to a wagon or sleigh with another perfectly well-broken horse and drive them slowly on the road. In this position he may be taught the meaning of horse-talk, the bit, and the whip, and then he may be driven alone without the least difficulty. Remember always to be patient and gentle and also that the colt knows nothing about what is expected of him.

If it be not convenient to employ another horse, permit the colt to examine the wagon, sulky, fore-wheels, or sleigh, until he has no fear of it, and then he may be harnessed alone and driven slowly without danger.

In breaking a colt to harness, it is better to use a bridle without blinders or blinkers, that he may understand what is done. There are two reasons assigned for the use of blinders—one is that a horse with a large head looks better with them, and the other that a horse is less likely to become lazy if he cannot see when the whip is about to be applied. A spirited, well-formed horse, looks better and behaves better without blinders than with them.

The colt having been made familiar with the harness should be taught to go in a covered buggy or chaise, and then trained to walk properly and rapidly, and to trot in good style, and should never be suffered to assume any other pace. If he has not already learned it he should now be taught to back and also to draw.

Spirited Thoroughbred horses, if badly treated, are apt to acquire the very dangerous habit of backing down a hill instead of going up it whenever they take the notion, or of balking or jibbing, or refusing to proceed either with or without reason. This is one of the most vexatious vices to which horses are liable, and should be prevented if possible by proper treatment in the beginning of the harness-education. If, however, a horse become addicted to the habit it is very difficult to make him forget it and go always when told to do so, and it is not possible to force or persuade a high-bred horse to pull upon a heavy load more than once or twice unless it starts. A draught horse, however, from his more patient disposition, and from his inherited fitness for the work, will frequently exert all his strength at a dead pull as often as he is commanded to do so.

The best method of treatment for a balky horse is to caress him, and after removing all other persons to a distance attempt to move him to the right and left, and then forwards. If he will not proceed hold up the nigh fore-leg, and then bidding him go, suddenly drop the foot, and he will usually move along. Mr. Rarey says he has never failed by such means in making a balky horse go within fifteen and often in three minutes.

If there are two horses in a team, only one is generally balky, and after they have become quiet from kind words and caressing, take the balky horse by the head, standing before him to prevent him from starting too suddenly, and turn the team first one way and then the other, and when they move willingly and are fairly in their collars, let them go forward. Whipping very rarely does any good with balky horses, serving only to enrage and confuse them. Nothing is more trying to one's patience than a balky horse, and very cruel means are often resorted to for the purpose of compelling a start. Thus one recommends sticking a pin through the knob of the cartilage in the bottom of the ear. Another says put a bundle of straw under him and set fire to it, or hitch a chain about his neck and drag him by means of an ox team.

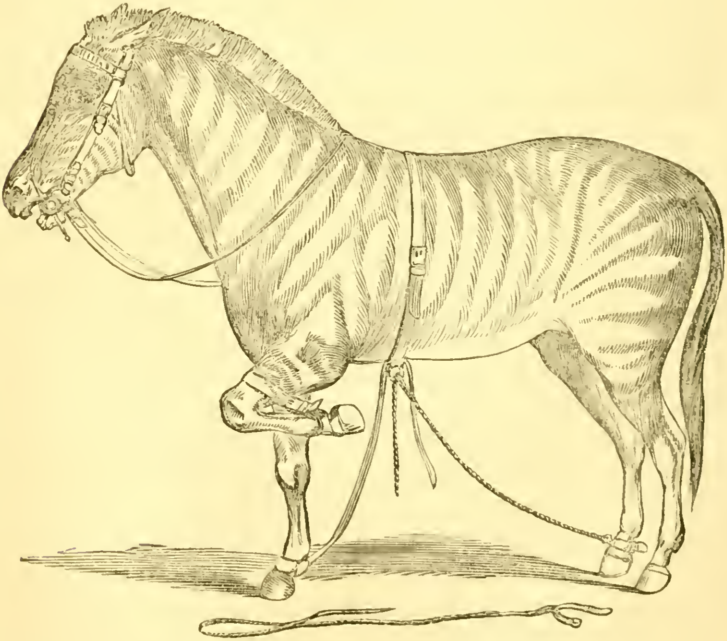
Probably, however, every horse may be most thoroughly cured of the vice by means of a patent machine, invented by Dr. Bunting of England, and which is also adapted for subduing horses that attempt to throw their riders by rearing, kicking, back-jumping, or lying down, or that kick, or run away or bolt, or are otherwise unmanageable or dangerous in harness.

This break consists of a common capstan head, into which are inserted two poles, twenty feet in length, in such a manner that the diverging ends are about twelve feet apart, and upon the outside end of each pole as upon an axle, is a cart wheel which supports it. A pair of stiff, smooth bars of the requisite length are placed about three feet apart upon the long poles passing from one to the other as near the wheels as possible. The outside bar should be made movable so as to admit the horse, and then securely fastened by bolts or straps. The horse should be harnessed as in a pair of shafts, but stout straps must be so employed as to render it impossible for him either to rear or kick, or throw himself down. For this purpose one may pass around his body at the girting place, being attached immovably to the bars, another over his loins or hips, and another under his belly. The horse is now entirely unable to do any damage, and after a few struggles, if vicious enough to attempt resistance, may be driven about the capstan as long as may be necessary to subdue or quiet him. A rider also may mount him and render him submissive and gentle under the saddle. If he persists in being alarmed at any sight or sound, he may now be familiarized with it, and the driver seated upon the pole behind him with a good whip, and if need be a curb bit, as persuaders, will have little trouble in securing implicit obedience to all his reasonable commands. Of course, the same principles of education must be employed here as elsewhere, and the horse-breaker must not abuse his power by acting the bully over his helpless pupil, but should treat him with the greatest kindness, patting, coaxing, and feeding him, while at the same time convincing him that resistance is unavailing, and wilful disobedience sure to be followed by deserved punishment.

The method adopted with such marvelous success by Mr. Rarey for the complete subjugation of wild colts or vicious horses and zebras is very simple and easily understood. To practice it in perfection requires a special talent for the business, although almost any person may manage an ordinary horse. Beginners should commence their first experiments upon well broken horses, and gradually advance to the more difficult cases. The whole secret of the art consists in rendering the horse perfectly helpless, and making him believe opposition to your wishes is quite useless. This is accomplished by strapping up the nigh fore-leg as in the directions already given for teaching a colt to lie down, and then laying the horse down once, twice, or twenty times, according to the necessities of the case, until he becomes submissive and tractable. Whenever during his education he shows a disposition to fight or resist, throw him down, and by repeatedly raising his head to his shoulder and laying it back upon the ground, remove all his stiff-neckedness.

If he be particularly sensitive in any part of his body handle that part until he is quiet. Thus if inclined to kick handle his legs and move them about until perfectly supple and peaceable, and rub him on the flanks and inside of the legs, always lightly and with the hair until no nervousness remains. If he be frightened when he gets his tail over the rein, handle his tail, putting a strap under it and drawing it back and forth till he is accustomed to it.

If inclined to bite, open and shut his jaws snapping his teeth together until his inclination to use them improperly is gone; or use a gag-bit an inch and a half in diameter and made of hard wood, and he will learn that it is impossible to bite.



The complete apparatus used by Mr. Rarey in taming the most vicious horse is represented in the accompanying cut of the zebra, which was subdued by him while in London. Upon him is a bridle with the gag-bit, and around his body a surcingle with a stout ring under the belly through which to pass and fasten the straps or hobbles upon the feet. The nigh fore-foot is strapped as usual at the commencement of the operation of taming. Upon the off fore-foot is a strap by which this foot is to be pulled up and either firmly held in the hand after passing under the surcingle, or through the ring; or the strap may be drawn through a spring-buckle attached to the surcingle so that when once drawn up it will not slip back. The hobbles on the hind feet are not generally necessary, but very violent brutes will kick even after they are down, and such must have all their feet drawn up to the surcingle and tied there until they surrender.

After a wild colt or horse has been thus exhausted and subjugated, a saddle or harness may be brought and laid upon his body, and then he may be allowed to get up and will permit them to be put on without alarm. The operator should sit, and lie down, and stand upon various parts of the prostrate and conquered animal, and after he rises may mount him with perfect safety.

The process of taming or subduing a horse may be undertaken in a smooth, open field, but can be performed most expeditiously and satisfactorily in an inclosure about thirty feet square, although a smaller space will answer.

All other persons and horses, and every thing that could distract the attention of the subject, should be removed from sight or hearing. The floor or ground should be covered with sawdust, or tan-bark, or straw, so as to prevent injury to the horse's knees, and it is safer always to use upon valuable, spirited horses, knee-pads.

As soon as the horse finds that his fore-legs are confined he will begin to struggle more or less violently to free himself. There is little danger either to the horse or man provided the operator be calm and stand just back of the subject, guiding him and restraining him with the reins. His resistance will also be less vigorous if he be compelled to hop about upon three legs until evidently fatigued, before the attempt be made to force him to lie down. Some horses will rise upon their hind legs but once or twice, while others will rear and plunge in a manner quite alarming to those who do not understand how unavailing such efforts are, and how certainly they will cease before the expiration of fifteen minutes. Most horses will succumb in eight minutes, and nearly all in ten, and, after the first grand struggle, they rarely resist the second time, but when brought upon their knees soon lie down quietly. After he has become weary and begins to show an inclination to assume a more comfortable position he should be encouraged to do so by patting and gentle words, and by pulling his nose around towards his off shoulder and crowding somewhat against his withers. Endeavor to provide a suitable place for him to lie, and when he comes down treat him very kindly. As soon as he will permit you to raise and lower his head without opposition, and ceases grunting and struggling, remove the straps from his legs and straighten them out. Then walk around him, talk to him, handle him, and when he is sufficiently docile, let him get up, and, if necessary, kindly assist him.

This is the whole process, by a constant repetition of which every horse can be rendered pleasant, willing and manageable in the hands of a good horseman. It must be remembered, however, that it will not always be profitable to spend the requisite amount of time and labor upon every horse to make him safe and useful in every place. On the contrary, ordinary horses with confirmed troublesome tricks or vices should, if possible, be put into some one of the many kinds of work where these habits will do little harm, as upon a railroad car, a stage coach, or in some kind of machine where they must move in a circle or upon a revolving platform.

Finally, since to educate colts and break vicious horses successfully, requires a sort of genius for the business, and much experience as well as suitable apparatus, would it not be a useful and honorable occupation in which a few young men of good character might engage with great advantage to themselves and to the community? Every year a vast amount of property in the form of horses and vehicles is destroyed, much unnecessary alarm endured, many limbs broken, and not a few lives lost in consequence of the fact that our horses are so imperfectly educated, so easily frightened, and so unmanageable, because never thoroughly subdued. There certainly is loss enough thus annually incurred to pay a handsome salary to one horse-breaker for every town in the State.

If, with his skill as a teacher, he could combine a scientific knowledge of the veterinary art, he would be really one of the most valuable members of the community, and could not fail of a competent support.

SOUNDNESS.

In reply to the inquiry, "What is a sound horse?" it may be said that it is a thing much easier to define than to procure. In the interesting English work, entitled, "The Horse in Health and Disease, by Dr. James H. Winter," is the following rhythmical statement, which is not far from the truth upon this subject:

"When may a horse be called sound?
When no disease upon 't be found,
When neither blind nor broken-winded,
Nor lameness—just begun or mended,
Nor any cause at time of sale,
That 'gainst his duties may prevail."

Unsoundness has reference only to disease, or to that alteration of structure, from whatever cause, which impairs or is likely to impair the natural usefulness of the horse, and has no necessary connection with his speed, endurance, sure-footedness, or style. In buying or exchanging horses the following form of receipt should be taken as a warranty. "Received of A. B. two hundred dollars for a bay gelding, warranted only five years old, sound, free from vice, and safe to ride or drive."

AGE.

The age of horses is accurately indicated by the appearance of the incisor and canine teeth, until they are more than eight years old, after which time it can only be determined approximately by various signs, such as the angle of the incisor teeth with the jaws, the form, length and marks of the appearance of the lips, and of the bars in the mouth, hollows above the eyes, the presence of gray hairs upon the head, the general prominence of the bones, and want of smoothness and plumpness, and so forth. The character of the teeth, as well as the other evidences of age to be relied upon, may be best learned by the examination of horses whose ages are known, under the direction of a person who understands the subject.

DISEASES.

Information respecting the diseases of horses and their remedies may be obtained from some one of the numerous works upon veterinary science, none of which perhaps is better adapted for general use than that standard English treatise, "The Horse, by William Youatt." A revised and enlarged edition, by E. N. Gabriel, was published in London in 1859, which, besides a chapter upon "Draught," contains a very complete account, with many illustrations, of the appearance of the teeth at different ages.

STATISTICS.

The number of horses in the Commonwealth in 1850 was seventy-four thousand and sixty, and in 1860, ninety thousand seven hundred and twelve, showing an increase of more than twenty-two per cent.; while the number of working oxen diminished in the same time more than twenty-seven per cent. It is to be regretted that the census statistics do not inform us how many colts were foaled in the State in any one year, or what proportion of our horses were imported from Canada, Vermont, New York, Pennsylvania, and other States. It is certain, however, that the majority of our horses are bred out of Massachusetts, and that a vast amount of money is annually carried abroad, for the purchase of horses, much of which ought to be retained at home by our farmers as the reward of their industry. By proper attention to the raising of horses, both the farmers, and all others, who employ them for business or pleasure, might be furnished with much more valuable animals at a more reasonable price.

In conclusion, your Committee are impressed with the belief that the subjects discussed in this report, relating to the improvement of our breeds of horses, and the proper methods of feeding, shoeing, grooming, and educating them so as to render them as pleasant, intelligent, beautiful, useful and durable as possible, are well worthy of consideration, and only regret their inability to perform in a more satisfactory manner the important task assigned them.

THE ASS.

The ass, or donkey, is a remarkable animal, very rarely seen in New England. In most countries of the old world, particularly around the Mediterranean, these creatures are very numerous and occupy a position in society for which they were evidently designed from the beginning. The Chinese have a proverb, which says, " a woman's heart bears breaking a great many times." Whether this be true or not, it is certain that donkeys are killed every day, and yet nobody ever saw a dead donkey. They were created for the special use of poor, brutal, half-civilized men, and therefore their nerves of sensation were left in an undeveloped state. Consequently they seem to enjoy abuse, whipping producing only an agreeable titillation upon their dry, hard skins, which are fit only for drum heads and parchment, and upon which no vermin of any kind can possibly subsist. Like the West-Indian negroes, who eat greedily cayenne pepper, and drink molasses and undiluted rum, asses prefer food which has a strong and pungent taste, and will select thorns, thistles, and the coarsest and bitterest herbage in preference to soft, sweet grass. This insensibility of their nerves renders necessary also their enormous ears, without which they could not hear at all, while their voices like those of deaf people generally are not very musical, and like them donkeys speak very loud, being heard distinctly three miles. Their structure is more stiff and angular than that of the horse, so that to ride one with comfort it is customary to get well back over the hind legs. The tail resembles that of the cow more than that of the horse, and the hair of the body is generally coarse, long, and of a grayish or dun color, though sometimes nearly black.

There are many breeds of asses, as of horses, and they vary in height from seven to fifteen hands, and in weight from three hundred to one thousand pounds.

They are usually employed for carrying burdens on pack saddles, though sometimes harnessed to carts or wagons.

The asses of Spain are very fine and more numerous than the horses.

Professor Low says: "Asses are now an object of economical importance in England. They are chiefly, indeed, the property of the poor; but whoever owns them, they are beasts of useful labor, largely employed by a numerous class, and meriting more attention than they have yet received. Great numbers of she-asses are kept about London and the larger towns for their milk, which is a mild, salutary, and nutritious beverage."

In Persia and Arabia very lively and good-looking asses are bred which are highly esteemed for the saddle, and which are but slightly removed from the wild asses found in these countries.

The male asses are called jacks, and females jennies, and the best animals for mule breeding, which is their most important use, are brought from the island of Malta.

The first Maltese jack imported into this country was sent by La Fayette as a present to Washington, by whom he was highly prized, in the year 1787. He was called the "Knight of Malta," and is described as "of moderate size, great activity, clean-limbed, having the fire and ferocity of a tiger, and of a dark brown color, with white belly and muzzle."

Formerly many jacks were imported into New Haven from the Cape Verde Islands, and distributed through Connecticut and the other New England States. They were, however, of inferior quality, and the mules got by them of little value. More recently many fine jacks have been imported from Malta and Spain, and employed chiefly in the States of New Jersey, Ohio, and Kentucky, where the finest mules in the world are now bred.

THE MULE.

The mule is the offspring of the jack and the mare, and like most hybrid animals is incapable of reproduction. These most serviceable creatures have been used for riding and carrying burdens, and occasionally for draught, from the earliest times, being mentioned in the book of Genesis even before horses. They combine the size and activity of the horse with the form and hardihood of the ass, while they surpass them both in surefootedness and longevity. They are less easily fatigued than horses, and recover much more rapidly and certainly when worn down, or injured by excessive work. They are quite as spirited as horses, walk as fast and pull more steadily. They are better kept at two-thirds the cost and much less liable to disease, rarely becoming lame and never foundered nor broken-winded. They have small, hard feet, which require but little shoeing, and though they sink in soft land deeper than horses, they extricate themselves much better, scarcely ever throwing themselves down, and never stumbling. They carry their feet close together and work admirably between rows of corn, carrots, and other crops, and are very tractable, obeying the voice so as to render the use of reins or driver quite unnecessary. Even upon the heavy wagons drawn by four or six mules among the mountains of Pennsylvania, the teamsters manage them entirely with the voice and the whip.

Mules are fit for hard work from the age of three years until thirty or forty years old, and they have repeatedly been known to live more than seventy years. Indeed, it is not common to keep any account of their age, as, if in good condition, they are sure to last long enough. It may be safely estimated that a good mule team will survive at the same work three times as long as a horse team. In mountainous countries mules are almost indispensable, being able to subsist on scanty fare, to carry heavy loads, and to go where no other beast of burden would venture — even sliding swiftly down steep declivities with perfect security. They are also the only animals which can endure the treatment of the stupid, careless plantation negro, or labor with him under the burning sun of the sugar, rice, and cotton regions of the South.

When well bred these animals are often good-looking and excellent travellers. In Spain and Portugal they are preferred to horses for the carriages of the kings and nobles. In Lisbon a pair of fine carriage mules will command $1,500.

It has been objected to the employment of mules for farm work that they are less handsome, and cannot therefore be used for driving so well as horses. With the care usually bestowed upon them, farmers' horses are certainly not remarkable for beauty, and it may be safely affirmed that with the same treatment good mules would look better than one-half the horses.

Again, they are said to be vicious. This is strenuously denied by many intelligent men who have used them, and it appears probable that this bad reputation results principally from the fact that they are very badly treated by the ignorant and brutal persons, who commonly have charge of them. They have, however, a peculiar temper, and are more easily coaxed than driven. They are also very revengeful, and never forget the man who abuses them, but at the same time never fail to appreciate kind treatment.

The celebrated naturalist, Mr. Darwin, speaking of the mules of South America, says: "In a troop each animal carries, on a level road, a cargo weighing four hundred and sixteen pounds; but in a mountainous country, a hundred pounds less. Yet with what delicate, slim limbs, without any proportionate bulk of muscle these animals support so great a burden! The mule always appears to me a most surprising creature. That a hybrid should possess more intelligence, memory, obstinacy, social affection and power of muscular endurance than either of its parents, seems to indicate that art has here outmastered nature."

Formerly great numbers of mules of very inferior quality were bred in New England, and shipped principally from New Haven for the Southern States and the West Indies. But the low price of such poor animals, together with the competition which sprang up in the Western States, caused the stock-growers to turn their attention to the raising of horses, until now a mule has come to be a rare animal.

In Kentucky and Ohio, many excellent mules are now bred, and with very great profit. The finest jacks only are used, and these are often crossed with splendid Thoroughbred mares. Abundantly fed upon nutritious blue grass and corn, the young mules grow rapidly to a great size, some of them equalling in stature the tallest horses, being more than eighteen hands high.

In November, 1859, in Kentucky, mules six months old were sold by the hundred for $80 a-piece; yearlings for $120; and two year olds for from $160 to $180. Hon. A. G. Talbot, of Boyle County, Kentucky, sold in December, 1859, two hundred yearling mules for $30,000, or $150 each. In St. Louis, the best truck mules are worth $500 each.

After the death of Washington, eight mules bred by him at Mount Vernon, were sold for more than $200 a-piece.

In France more than one million of the one million five hundred thousand mares in the country are kept for breeding mules, which clearly shows how highly they are esteemed for farm labor.

The whole number of asses and mules in this State, according to the census of 1860, is one hundred and twenty-seven; but many persons are beginning to inquire into their merits, and it may be safely affirmed that there will be ten times as many in 1870. There is no doubt that at the present prices of stock of all kinds good mules are the most profitable animals to raise for sale, and they certainly are unsurpassed in ability to perform severe and constant labor, at a moderate expense for keeping, and small risk of sickness or injury. The testimony of all who have given them a fair trial is decidedly in favor of the economy of employing mules in preference to any other animal for draught, either upon the farm or on the road.

It should be remarked that a mare once covered by a jack, need never again be expected to produce a good colt, but should be put only to raising mules.

There are some very curious and wise provisions in nature respecting the influence of the male animal, not only upon the immediate offspring, but also upon the female herself, and all her future progeny. It seems to be a well established fact, that the male animal which first impregnates a female, imparts something of his character, both to her and to all her future young. Thus, a mare was once covered by a quagga, and produced a striped mule. Afterwards she had colts by three different stallions, but every one was striped, and resembled in other respects the quagga; and similar results follow when mares are once impregnated by a jack and afterwards by a stallion. It follows, obviously, from this principle, that mares which have been served by inferior stallions, are much less valuable for breeding purposes than they would have been if they had been covered only by males of the best quality. The same rule, of course, applies to other animals.

It has been suggested in explanation of this singular phenomenon, that the effect upon the female may be caused in part by the fact, that her blood circulates through the fetus, and thus acquires something of its peculiar nature, derived from its sire.

It appears also that the fancy, or imagination, of the female produces a marked effect upon her offspring. Hence the judicious custom of causing the male animal to remain for a considerable time in the sight of the female at the period of copulation; and it has been distinctly proved, that when this course is adopted, the young are very sure to resemble their sire in form and color.

Again, it is certain that the male animal has more violent passions, and exerts a much greater influence upon the young than the female; and this is a most important law, because the male, especially of domestic animals, affects annually the quality of from fifty to one hundred times more individuals of a species than the female.

Among hybrid animals, it is observed that males are two or three times more numerous than females, and they partake more of the character of their sires than of their dams. Thus in the common mule, we see that the general characteristics, as the ears, voice, head, tail, feet and temper are asinine; while in the hinny, or progeny of the stallion and female ass, we find the same qualities of the horse to predominate. The size alone seems to depend more upon the female than the male, which results from the fact, that the young animal being produced within and nourished by the dam, must of necessity be proportioned to her capacity.

It may also be mentioned here, that among wild animals the males fight desperately for the privilege of propagating their species, and this weighty responsibility devolves, at last, exclusively upon the few most vigorous and powerful of the race, which is thus preserved in its original perfection.

Finally, there is another principle which the breeder should never forget, namely: that among domesticated animals, those which have been bred in the same manner, and for the same objects, during many successive generations are much more sure to impress their likeness upon their progeny than any others. Hence, when Thoroughbred males of the desired varieties can possibly be procured, they should invariably be employed, in preference even to grade animals, which may be in appearance much their superiors.

Respectfully submitted.

W. S. Clark.
George M. Atwater.
George Marston.

The subject of the flowage of low lands having been introduced, it was referred to a committee of three, consisting of Messrs. Davis, Grennell and Sewall, who, having fully considered it, submitted the following

REPORT:

Your Committee respectfully report, that they have entered upon the consideration of the subject submitted to them with a sincere desire to do full justice to the rights of the manufacturing and agricultural interests of the Commonwealth. There is no doubt that much valuable land is flowed in this Commonwealth by dams erected for manufacturing purposes. The original object of the laws now known as the Mill Acts, was to encourage grist and saw mills in a new country, where land was of little value, and it was of paramount importance to the agriculturist himself that the woods should be cleared, lumber sawed, and his grain and corn ground at a neighboring mill. The erection of mills has been encouraged from the earliest times in England, in order that the inhabitants of different sections might have free access to some mill for grinding their corn. For this purpose lords of manors erected mills on their domains for the public advantage, on the condition that the inhabitants within their respective seignories should grind their corn at the respective mills so erected, and the commerce thus initiated was called "doing grist" to the mill.

The old statutes of Massachusetts speak of mills as greatly beneficial to the subject, and the preamble of the provincial statute of the twelfth year of Queen Anne, chap. 1, recites that mills sometimes fall into despair, and are rendered useless and unserviceable, if not totally demolished, *to the hurt and detriment of the public*, as well as the loss to the partners who are ready to rebuild. The eighth chapter speaks of "mills serviceable to the *public good* and the benefit of the town." These statutes took away the right which the land owner before possessed of removing from his land a nuisance, and another provincial statute of George II., gave treble damages for the trespass of taking up or injuring any dam used for a mill. In 1795 the provincial Acts were revised, and it was provided that the mill-owner may flow *any* lands not belonging to him, necessary to raise a suitable head of water for his mill, upon payment of damages assessed by a jury. Under this statute it is important however to note that the jury were to determine how far the circumstances of each particular case justified such flowing. This statute was followed by others in 1824 and 1825, and the Act of the Revised Statutes. The statutes of Maine, Rhode Island, and North Carolina, are generally similar in principle to those of Massachusetts.

It is asserted or implied in the resolutions submitted to your Committee that these statutes abuse the right of eminent domain, infringe the spirit of the constitution, and are not within the power delegated by the people to the legislature. But these statutes have too long been the subject of judicial decision to permit us to dispute for a moment their constitutionality. While we must admit the undoubted constitutionality of these laws, the propriety and necessity of their continuance under change of circumstances are legitimate subjects of inquiry. In the case of Stowell *v.* Flagg, 11 Mass. Reports, 364, Chief Justice Parker when speaking of the statutory laws of our State subsequent to the Revolution, which re-enacted, in substance, the provincial Acts to which we have referred, said: "We cannot help thinking that this statute was *incautiously* copied from the ancient colonial and provincial Acts which were passed when the use of mills, from the necessity of them, bore a much greater value compared to the land used for the purposes of agriculture than at present." Whether the learned Chief Justice was right in his impression at that period or not, your Committee cannot fail to observe that under these mill Acts, originally intended to encourage saw and grist-mills only, a large and important manufacturing interest has grown up in Massachusetts, furnishing employment to the people, encouragement to commerce, and a market to the farmer. With rights already acquired we cannot if we would, legally interfere. But your Committee are informed that in many portions of the Commonwealth saw-mills or small manufacturing establishments furnishing little or no employment to the people, running at irregular intervals, and, undoubtedly, manufacturing so small an amount that the net product is often much less than the possible net product of the hundreds of acres of land which they flow or destroy. But in these cases the right of flowage is generally acquired by prescription or absolute grant, and the question presented is an economical question presented to the judgment of the mill-owner himself.

Since the enactment of the mill Acts, however, and since the establishment of the large manufactories of this Commonwealth, the use of steam as a motive power has been discovered, and has, at last, become a cheap and constant source of power, enabling the manufacturer to establish his mill where great expense of carriage for the raw material may be saved, and shipment of the manufactured article readily effected. And the question properly recurs whether, under existing circumstances, a power so stringent as is now given by the mill Acts should be granted by the legislature. The real question is whether authorizing the flowing of another's land, without his consent, is in all cases sufficiently for the public good to justify depriving the owner of the use of it, even for a just compensation. It is not pretended that the legislature can take the property of one individual, and, without his consent, give it to another, even for a fair compensation, except upon the highest and surest grounds of public benefit or necessity.

It cannot be denied that the legislature as well as courts of law, seem hitherto to have been disposed rather to enlarge than to curtail the statutory privileges of mill-owners. So broad a construction has been given to the statutes of Massachusetts, that the power of creating reservoirs, remote from, but auxiliary to the pond and dam below, has been vindicated; and in the case of the Woolcut Manufacturing Company *v.* Upham, 5 Pick. 292, the reservoir for the use of the mill was more than three miles above the pond at which the mill was erected,—and the court have even decided that if the owner of a mill erects a dam at the outlet of a natural pond, which flows into a stream upon which his mill is situated, for the purpose of creating a reservoir for his mill, he has a right to flow the land of another all about the pond.

It is difficult to perceive how it can be honestly alleged that in every case of flowage by one who is about to erect a mill, however small, with a product however insignificant, running, perhaps, at irregular intervals, and flowing or inundating large sections of the country, public benefit demands the application of the right of eminent domain. It is not true that in all cases the public is benefited, and although in an earlier stage of the settlement of the country, and before the application of steam, the balance of benefit to the public may have been in favor of mills, it cannot be asserted that the legislature have any right to apply the unlimited and sweeping power of condonation allowed by the mill act one step further or one moment longer than the legislature, in the exercise of a wise and constitutional discretion, is satisfied that the public benefit or necessity requires it.

The supreme court of the State of New York have boasted in the following words, that "The legislature of this State, it is believed, have never exercised the right of eminent domain in favor of mills of any kind. Sites for steam-engines, hotels, churches, and other public conveniences might as well be taken, by the exercise of this extraordinary power." The Acts of Tennessee extend only to the condemnation of land for grist mills.

The question which presents itself, as it appears to your committee, is simply, under existing circumstances, what provision can be enacted by the legislature which shall secure existing rights of the mill-owner, and shall hereafter do full justice to the interests and demands both of the agricultural and the manufacturing interests of the Commonwealth. By the laws of Virginia and Kentucky, which have been substantially adopted in the States of Indiana, Missouri, Mississippi, Alabama and Florida, and we believe in some other States, it is provided in substance that when a person desires to erect a mill or other engine of public utility, he shall apply to some court of record, who shall issue a writ to a jury appointed for the purpose who have authority to condemn for the mill owner an acre of land on the bank of the other side of the stream, if he do not own on both sides, to appraise the value of the same, to examine what other lands may be overflowed, and assess damage, regulate the height of dam and mode of flowage, and to decide whether the public benefit will be enhanced by the establishment of the mill, or whether the injury likely to result to the neighborhood by sickness or otherwise, will be greater than the benefit to be derived from the erection of a dam ; and the party applying for the same shall pay the value of the land taken, and the damage assessed, to the person entitled.

These statutes we think are enacted upon the right principle, as they do not involve the assertion by the legislature of the broad fact that every mill is a greater public benefit than the value of the land destroyed.

So far is such an assertion from the absolute fact, that in England, for the purposes of drainage, power has been granted to remove mill dams and other obstructions to agriculture for the benefit of agriculture, and the government has itself loaned vast funds to aid in improvements in drainage. Since our mill Acts were enacted, not only has steam become the grand motive-power of the world's machinery, but the whole art of drainage has come into existence, doubling the products of the farmer, and demonstrating the necessity of perfect drainage, the removal of standing water several feet from the surface, and the admission of air to the cultivated soil.

Inasmuch as a full drawn statute embracing the views of your committee is not strictly within the province of this Board, and requires the careful attention of the appropriate committee of the legislature, your committee content themselves with reporting that the Board of Agriculture recommend to the legislature to make such amendments to the mill Acts as shall hereafter protect the land-owner in the improvement and entire control of his land, in all cases where the erection of a dam is not shown to be of public utility or necessity.

Your committee also take pleasure in quoting in full the able and instructive chapter on Flowage and Drainage Acts from Judge French's work on Farm Drainage. The chapter is as follows :—

Nothing more clearly shows the universal interest and confidence of the people of Great Britain, in the operation of land-drainage, than the acts of Parliament in relation to the subject. The conservatism of England, in the view of an American, is striking. She never takes a step till she is sure she is right. Justly proud of her position among the nations, she deems change an unsafe experiment, and what has been, much safer than what might be. Vested rights are sacred in England, and especially rights in lands, which are emphatically real estate there.

Such are the sentiments of the people, and such the sentiments of their representatives and exponents, the Lords and Commons.

Yet England has been so impressed with the importance of improving the condition of the people, of increasing the wealth of the nation, of enriching both tenant and landlord, by draining the land, that the history of her legislation, in aid of such operations, affords a lesson of progress even to fast Young America. Powers have been granted, by which encumbered estates may be charged with the expenses of drainage, so that remainder-men and reversioners, without their consent, shall be compelled to contribute to present improvements; so that careless or obstinate adjacent proprietors shall be compelled to keep open their ditches for outfalls to their neighbors' drains; so that mill-dams, and other obstructions to the natural flow of the water, may be removed for the benefit of agriculture; and, finally, the government has itself furnished funds, by way of loans, of millions of pounds, in aid of improvements of this character.

In America, where private individual right is usually compelled to yield to the good of the whole, and where selfishness and obstinacy do not long stand in the pathway of progress, obstructing manifest improvement in the condition of the people, we are yet far behind England in legal facilities for promoting the improvement of land culture. This is because the attention of the public has not been particularly called to the subject.

Manufacturing corporations are created by special acts of legislation. In many States, rights to flow, and ruin, by inundation, most valuable lands along the course of rivers, and by the banks of ponds and lakes, to aid the water-power of mills, are granted to companies, and the landowner is compelled to part with his meadows for such compensation as a committee or jury shall assess.

In almost every town in New England there are hundreds, and often thousands of acres of lands, that might be most productive to the farmer, overflowed half the year with water, to drive some old saw-mill, or grist-mill, or cotton-mill, which has not made a dividend, or paid expenses, for a quarter of a century. The whole water-power, which, perhaps, ruins for cultivation a thousand acres of fertile land, and divides and breaks up farms, by creating little creeks and swamps throughout all the neighboring valleys, is not worth, and would not be assessed, by impartial men, at one thousand dollars. Yet, though there is power to take the farmer's land for the benefit of manufacturers, there is no power to take down the company's dam for the benefit of agriculture. An old saw-mill, which can only run a few days in a Spring freshet, often swamps a half-township of land, because somebody's great-grandfather had a prescriptive right to flow, when lands were of no value, and saw-mills were a public blessing.

There are numerous cases, within our own knowledge, where the very land overflowed and ruined by some incorporated company, would, if allowed to produce its natural growth of timber and wood, furnish ten times the fuel necessary to supply steam-engines, to propel the machinery carried by the water-power.

Not satisfied with obstructing the streams in their course, the larger companies are, of late, making use of the interior lakes, fifty or a hundred miles inland, as reservoirs, to keep back water for the use of the mills in the summer droughts. Thus are thousands of acres of land drowned, and rendered worse than useless ; for the water is kept up till midsummer, and drawn off when a dog-day climate is just ready to convert the rich and slimy sediment of the pond into pestilential vapors. These waters, too, controlled by the mill-owners, are thus let down in floods, in midsummer, to overflow the meadows and corn-fields of the farmer, or the intervals and bottom-lands below.

Now, while we would never advocate any attack upon the rights of mill-owners, or ask them to sacrifice their interests to those of agriculture, it surely is proper to call attention to the injury which the productive capacity of the soil is suffering by the flooding of our best tracts, in sections of country where land is most valuable. Could not mill-owners, in many instances, adopt steam instead of water-power, and becoming land-*draining* companies, instead of land-*drowning* companies ; at least, let nature have free course with her gently-flowing rivers, and allow the promise to be fulfilled, that the earth shall be no more cursed with a flood.

We would ask for the land-owner, simply equality of rights with the mill-owner. If a legislature may grant the right to flow lands, against the will of the owner, to promote manufactures, the same legislature may surely grant the right, upon proper occasion, to remove dams and other obstructions to our streams, to promote agriculture. The rights of mill-owners are no more sacred than those of land-owners ; and the interests of manufactures are, surely, no more important than those of agriculture.

We would not advocate much interference with private rights. In some of the States, no special privileges have been conferred upon water-power companies. They have been left to procure their rights of flowage, by private contract with the land-owners ; and in such States, probably, the legislatures would be as slow to interfere with rights of flowage, as with other rights. Yet, there are cases where, for the preservation of the health of the community, and for the general convenience, governments have everywhere exercised the power of interfering with private property, and limiting the control of the owners. To preserve the public health, we abate as nuisances, by processes of law, slaughter-houses, and other establishments offensive to health and comfort, and we provide, by compulsory assessments upon land-owners, for sewerage, for sidewalks, and the like, in our cities.

Everywhere, for the public good, we take private property for highways, upon just compensation, and the property of corporations is thus taken, like that of individuals.

Again, we compel adjacent owners to fence their lands, and maintain their proportion of division fences of the legal height, and we elect fence-viewers, with power to adjust equitably, the expenses of such fences. We assess bachelors and maidens, in most States, for the construction of school-houses, and the education of the children of others, and, in various ways, compel each member of society to contribute to the common welfare.

How far it may be competent, for a State legislature to provide for, or assist in, the drainage of extensive and unhealthy marshes; or how far individual owners should be compelled to contribute to a common improvement of their lands; or how far, and in what cases, one land-owner should be authorized to enter upon the land of another, to secure or maintain the best use of his own land—these are questions which it is unnecessary for us to attempt to determine. It is well that they should be suggested, because they will, at no distant day, engage much attention. It is well, too, that the steps which conservative England has thought it proper to take in this direction, should be understood, that we may the better determine whether any, and if any, what course our States may safely take, to aid the great and leading interest of our country.

The swamps and stagnant meadows along our small streams and our rivers, which are taken from the farmer, by flowage, for the benefit of mills, are often, in New England, the most fertile part of the townships—equal to the bottom lands of the West; and they are right by the doors of young men, who leave their homes with regret because the rich land of far-off new States offers temptations, which their native soil cannot present.

It is certainly of great importance to the old States, to inquire into these matters, and to set proper bounds to the use of streams for water-powers. The associated wealth and influence of manufacturers, is always more powerful than the individual efforts of the land-owners.

Reservoirs are always growing larger, and dams continually grow higher and tighter. The water, by little and little, creeps insidiously on to, and into, the meadows far above the obstruction, and the land-owner must often elect between submission to this aggression, and a tedious law-suit with a powerful adversary. The evil of obstructions to streams and rivers, is by no means limited to the land visibly flowed, nor to land at the level of the dam. Running water is never level, or it could not flow; and in crooked streams which flow through meadows, obstructed by grass and bushes, the water raised by a dam, often stands many feet higher, at a mile or two back, than at the dam. It is extremely difficult to set limits to the effect of such a flowage. Water is flowed into the subsoil, or rather is prevented from running out; the natural drainage of the country is prevented; and land which might well be drained artificially, were the stream not obstructed, is found to lie so near the level, as to be deprived of the requisite fall by back water, or the sluggish current occasioned by the dam.

These obstructions to drainage have become subjects of much attention, and of legislative intervention in various forms in England, and some of the facts elicited in their investigations are very instructive.

In a discussion before the Society of Arts, in 1855, in which many gentlemen, experienced in drainage, took a part, this subject of obstruction by mill-dams came up.

Mr. G. Donaldson said he had been much engaged in works of land-drainage, and that, in many instances, great difficulties were experienced in obtaining outfalls, owing to the water-rights, on the course of rivers for mill-power, &c.

Mr. R. Grantham spoke of the necessity of further legislation, "so as to give power to lower bridges and culverts, under public roads, and straighten and deepen rivers and streams." But, he said, authority was wanting, above all, "for the removal of mills, dams, and other obstructions in rivers, which, in many cases, did incalculable injury, many times exceeding the value of the mills, by keeping up the level of rivers, and rendering it totally impossible to drain the adjoining lands."

Mr. R. F. Davis said, "If they were to go into the midland districts, they would see great injury done, from damming the water for mills."

In Scotland, the same difficulty has arisen. "In many parts of this country," says a Scottish writer, "small lochs (lakes) and dams are kept up, for the sake of mills, under old tenures, which, if drained, the land gained by that operation, would, in many instances, be worth ten times the rent of such mills."

In the case of the Rye and Derwent Drainage, an account of which is found in the 14th volume of the Journal of the Royal Agricultural Society, a plan of compensation was adopted, where it became necessary to remove dams and other obstructions, which is worthy of attention. The commissioners under the Act of 1846, removed the mill-wheels, and substituted steam-engines corresponding to the power actually used by the mills, compensating, also, the proprietors for inconvenience, and the future additional expensiveness of the new power.

"The claims of a short canal navigation, two fisheries, and tenants' damages through derangement of business during the alterations, were disposed of without much outlay; and the pecuniary advantages of the work are apparent from the fact, that a single flood, such as frequently overflowed the land, has been known to do more damage, if fairly valued in money, than the whole sum expended under the Act."

Under this Act, it became necessary for the commissioners to estimate the comparative cost of steam and water-power, in order to carry out their idea of giving to the mill-owners a steam-power equivalent to their water-power.

"As the greater part of their water-power was employed on corn and flour-mills, upon these the calculations were chiefly based. It was generally admitted to be very near the truth, that to turn a pair of flour-mill stones properly, requires a power equal to that of two-and-a-half horses, or on an average, twenty horses' power, to turn and work a mill of eight-pairs of stones, and that the total cost of a twenty-horse steam-engine, with all its appliances, would be $5,000, or $250 per horse power."

Calculations for the maintenance of the steam-power are also given; but this depends so much on local circumstances, that English estimates would be of little value to us.

The arrangements in this case with the mill-owners, were made by contract, and not by the force of any arbitrary power, and the success of the enterprise, in the drainage of the lands, the prevention of damage by floods, especially in hay and harvest-time, and in the improvement of the health of vegetation, as well as of man and animals, is said to be strikingly manifest.

This Act provides for a "water-bailiff," whose duty it is to inspect the rivers, streams, water-courses, &c., and enforce the due maintenance of the banks, and the uninterrupted discharge of the waters at all times.

COMPULSORY OUTFALLS.

It often happens, especially in New England, where farms are small, and the country is broken, that an owner of valuable lands, overcharged with water, perhaps a swamp or low meadow, or perhaps a field of upland, lying nearly level, desires to drain his tract, but cannot find sufficient fall, without going upon the land of owners below. These adjacent owners may not appreciate the advantages of drainage; or their lands may not require it; or, what is not unusual, they may from various motives, good and evil, refuse to allow their lands to be meddled with.

Now, without desiring to be understood as speaking judicially, we know of no authority of law by which a land-owner may enter upon the territory of his neighbor for the purpose of draining his own land, and perhaps no such power should ever be conferred. All owners upon streams, great and small, have, however, the right to the natural flow of the water, both above and below. Their neighbors below cannot obstruct a stream so as to flow back the water upon, or into, the land above; and where artificial water-courses, as ditches and drains have long been opened, the presumption would be that all persons benefited by them, have the right to have them kept open.

Parliament is held to be omnipotent, and in the Act of 1847, known as Lord Lincoln's Act, its power is well illustrated, as is also the determination of the British nation that no trifling impediments shall hinder the progress of the great work of draining lands for agriculture. The Act, in effect, authorizes any person interested in draining his lands, to clear a passage through all obstructions, wherever it would be worth the expense of works and compensation.

Its general provisions may be found in the 15th volume of the Journal of the Royal Agricultural Society.

It is not the province of the author, to decide what may properly be done within the authority of different States, in aid of public or private drainage enterprises. The State Legislatures are not, like Parliament, omnipotent. They are limited by their written constitutions. Perhaps no better criterion of power, with respect to compelling contribution, by persons benefited, to the cost of drainage, and with interfering with individual rights, for public or private advantage, can be found, than the exercise of power in the cases of fences and of flowage.

If we may lawfully compel a person to fence his land, to exclude the cattle of other persons, or, if he neglect to fence, subject him to their depredations, without indemnity, as is done in many States; or if we may compel him to contribute to the erection of division fences, of a given height, though he has no animal in the world to be shut in or out of his field, there would seem to be equal reason, in compelling him to dig half a division ditch for the benefit of himself and neighbor.

If, again, as we have already hinted, the legislature may authorize a corporation to flow and inundate the land of an unwilling citizen, to raise a water-power for a cotton mill, it must be a nice discrimination of powers that prohibits the same legislature from authorizing the entry into lands of a protesting mill-owner, or of an unknown or cross-grained proprietor, to open an outlet for a valuable, health-giving system of drainage.

In the valuable treatise of Dr. Warder, of Cincinnati, recently published in New York, upon Hedges and Evergreens, an abstract is given of the statutes of most of our States, upon the subject of fences, and we know of no other book, in which so good an idea of the legislation on this subject, can be so readily obtained.

By the statutes of Massachusetts, any person may erect and maintain a water-mill, and dam to raise water for working it, upon and across any stream that is not navigable, provided he does not interfere with existing mills. Any person, whose land is overflowed, may, on complaint, have a trial and a verdict of a jury; which may fix the height of the dam, decide whether it shall be left open any part of the year, and fix compensation, either annual or in gross, for the injury. All other remedies for such flowage are taken away, and thus the land of the owner may be converted into a mill-pond against his consent.

We find nothing in the Massachusetts statutes which gives to land-owners, desirous of improving their wet lands, any power to interfere in any way with the rights of mill-owners, for the drainage of lands. The statutes of the Commonwealth, however, make liberal and stringent provisions for compelling unwilling owners to contribute to the drainage of wet lands.

For the convenience of those who may be desirous of procuring legislation on this subject, we will give a brief abstract of the leading statute of Massachusetts regulating this matter. It may be found in chapter 115 of the Revised Statutes, of 1836. The first section explains the general object.

"When any meadow, swamp, marsh, beach, or other low land shall be held by several proprietors, and it shall be necessary or useful to drain or flow the same, or to remove obstructions in rivers or streams leading therefrom, such improvements may be effected, under the direction of commissioners, in the manner provided in this chapter."

The statute provides that the proprietors, or a greater part of them in interest, may apply, by petition. to the court of common pleas, setting forth the proposed improvements, and for notice to the proprietors who do not join in the petition, and for a hearing. The court may then appoint three, five, or seven commissioners to cause the improvements to be effected. The commissioners are authorized to "cause dams or dikes to be erected on the premises, at such places, and in such manner as they shall direct; and may order the land to be flowed thereby, for such periods of each year as they shall think most beneficial, and also cause ditches to be opened on the premises, and obstructions in any rivers or streams leading therefrom to be removed."

Provision is made for assessment of the expenses of the improvements, upon all the proprietors, according to the benefit each will derive from it, and for the collection of the amount assessed.

"When the commissioners shall find it necessary or expedient to reduce or raise the waters, for the purpose of obtaining a view of the premises, or for the more convenient or expeditious removal of obstructions therein, they may open the flood-gates of any mill, or make other needful passages through or round the dam thereof, or erect a temporary dam on the land of any person, who is not a party to the proceedings, and may maintain such dam, or such passages for the water, as long as shall be necessary for the purposes aforesaid."

Provision is made for previous notice to persons who are not parties, and for compensation to them for injuries occasioned by the interference and for appeal to the courts.

This statute gives, by no means, the powers necessary to compel contribution to all necessary drainage, because, first, it is limited in its application to "meadow, swamp, marsh, beach, or other low land." The word *meadow*, in New England, is used in its original sense of flat and wet land. Secondly, the statute seems to give no authority to open permanent ditches on the land of others than the owners of such low land, although it provides for temporary passages for the purposes of "obtaining a view of the premises, or for the more convenient or expeditious removal of obstructions *therein*"—the word "therein" referring to the "premises" under improvement, so that there is no provision for outfalls, under this statute, except through natural streams.

By a statute of March 28, 1855, the legislature of Massachusetts has exercised a *power* as extensive as is desirable for all purposes of drainage, although the provisions of the Act referred to are not, perhaps, so broad as may be found necessary, in order to open outfalls and remove all obstructions to drainage. As this Act is believed to be peculiar, we give its substance:

"An Act to authorize the making of Roads and Drains in certain cases.

"SECT. 1. Any town or city, person or persons, company or body corporate, having the ownership of low lands, lakes, swamps, quarries, mines, or mineral deposits, that, by means of adjacent lands belonging to other persons, or occupied as a highway, cannot be approached, worked, drained, or used in the ordinary manner without crossing such lands or highway, may be authorized to establish roads, drains, ditches, tunnels, and railways to said places in the manner herein provided.

"SECT. 2. The party desiring to make such improvements shall file a petition therefor with the commissioners of the county in which the premises are situated, setting forth the names of the persons interested. if known to the petitioner, and also, in detail, the nature of the proposed improvement, and the situation of the adjoining lands."

Section 3 provides for notice to owners and town authorities.

Section 4 provides for a hearing, and laying out the improvement, and assessment of damages upon the respective parties, "having strict regard to the benefits which they will receive."

Section 5 provides for repairs by a majority of those benefited; and Section 6 for appeals, as in the case of highways.

By an Act of 1857, this Act was so far amended as to authorize the application for the desired improvement, to be made to the selectmen of the town, or the mayor and aldermen of the city, in case the lands over which the improvement is desired are all situated in one town or city.

It is manifest certainly, that the State assumes power sufficient to authorize any interference with private property that may be necessary for the most extended and thorough drainage operations. The power which may compel a man to improve his portion of a swamp, may apply as well to his wet hill-sides; and the power which may open temporary passages through lands or dams, without consent of the owner, may keep them open permanently, if expedient.

LAND DRAINAGE COMPANIES.

Besides the charters which have at various times, for many centuries, been granted to companies, for the drainage of fens and marshes, and other low lands, in modern times, great encouragement has been given by the British government for the drainage and other improvement of high lands. Not only have extensive powers been granted to companies to proceed with their own means, to effect the objects in view, but the government itself has advanced money, by way of loan, in aid of drainage and like improvements.

By the provisions of two Acts of Parliament, no less than $20,000,000 have been loaned in aid of such improvements. These Acts are generally known as PUBLIC MONEYS DRAINAGE ACTS. There are already four chartered companies for the same general objects, doing an immense amount of business, on *private* funds.

It will be sufficient, perhaps, to state, in general terms, the mode of operation under these several Acts.

Most lands in England are held under incumbrances of some kind. Many are entailed, as it is termed; that is to say, vested for life in certain persons, and then to go to others, the tenant for life having no power to sell the property. Often, the life estate is owned by one person, and the remainder by a stranger, or remote branch of the family, whom the life-tenant has no desire to benefit. In such cases the tenant, or occupant, would be unwilling to make expensive improvements at his own cost, which might benefit himself but a few years, and then go into other hands.

On the other hand, the remainder-man would have no right to meddle with the property while the tenant-for-life was in possession; and it would be rare, that all those interested could agree to unite in efforts to increase the general value of the estate, by such improvements.

The great object in view was, then, to devise means, by which such estates, suffering for want of systematic, and often expensive, drainage operations, might be improved, and the cost of improvement be charged on the estate, so as to do no injustice to any party interested.

The plan finally adopted is, to allow the tenant or occupant to have the improvement made, either by expending his private funds, or by borrowing of the government or the private companies, and having the amount expended, made a charge on the land, to be paid in annual payments by the person who shall be in occupation, each year. Under one of these Acts, the term of payment is fixed at twenty-two years, and under a later Act, at fifty years.

Thus, if A own a life-estate in lands, and B the remainder, and the estate needs draining, A may take such steps as to have the improvement made, by borrowing the money, and repaying it by yearly payments, in such sums as will pay the whole expenditure, with interest, in twenty-two or fifty years; and if A die by the expiration of the term, the succeeding occupants continue the payments until the whole is paid.

A borrows, for instance, $1,000, and expends it in draining the lands. It is made a charge, like a mortgage, on the land, to be paid in equal annual payments for fifty years. At 6 per cent., the annual payment will be but about $63.33, to pay the whole amount of debt and the interest, in fifty years. A pays this sum annually as long as he lives, and B then takes possession, and pays the annual instalment.

If the tenant expend his own money, and die before the whole term expire, he may leave the unpaid balance as a legacy, or part of his own estate, to his heirs.

The whole proceeding is based upon the idea, that the rent or income of the property is sufficiently increased, to make the operation advantageous to all parties. It is assumed, that the operation of drainage, under one of these statutes, will be effectual to increase the rent of the land, to the amount of this annual payment, for at least fifty years. The fact, that the British government, after the most thorough investigation, has thus pronounced the opinion, that drainage works, properly conducted, will thus increase the rent of land, and remain in full operation a half century at least, affords the best evidence possible, both of the utility and the durability of tile drainage.

Your committee are of opinion that these suggestions of Judge French are entitled to the candid consideration of the people of Massachusetts, and entertain the hope that the time will soon come when the legislature of Massachusetts will see fit, by judicious legislation, to abate some of the useless dams which are now destroying thousands of acres of valuable land, and sending forth seeds of death among its inhabitants.

CHARLES G. DAVIS.
C. C. SEWALL.
JAMES S. GRENNELL.

At the same meeting it was

Voted, That the Secretary of the Board be directed to call the attention of the mayor and aldermen of cities, and the selectmen of the towns of this Commonwealth, on or before the 20th of April, annually, to the law for the protection of sheep against dogs, and to urge its enforcement; and that the Secretary be also directed to ascertain, on the first of October, annually, from the cities and towns of the Commonwealth, the number of dogs licensed, and the amount received therefor.

It was also

Voted, That the experiments in manures instituted by circulars issued by the Secretary of this Board, December 5, 1859, for a term of three years, shall be renewed; and that the Secretary be, and he is hereby instructed to issue the same circular, stating distinctly that the various agricultural societies shall offer premiums for the experiments in manures for three years, from April 1, 1861.

This is intended to apply to an entirely new series of experiments, and not to interfere with those whose entries have already been made, which are to be continued till they are completed in 1862. The importance of establishing an agricultural school having been introduced, it was

Resolved, That this Board, believing that the establishment of an Agricultural School would advance the interests of agriculture in this Commonwealth, is disposed to give its influence to any well-directed plan for such a school.

Voted to appoint a committee of five, by ballot, to coöperate at their discretion with any men, or any body of men, who may have any plan for an agricultural school to present, and report their proceedings at the next meeting of the Board.

A ballot having been taken, it was found that Messrs. Wilder, Walker, Clark, Stockbridge, and Sewall had a majority of votes, and were elected.

Some complaint having been made that the law requiring the weighing of the whole crop of grain, roots, &c., entered for the premiums of the agricultural societies was burdensome and inoperative, the subject was referred to a committee, which presented the following

REPORT:

The committee appointed to consider the act passed by the legislature, of 1859, with reference to obtaining the weight of crops entered for premium with the agricultural societies in the State, would respectfully report:—

That, in their opinion, the law in question imposes unnecessary burdens upon the farmers of the Commonwealth, without securing the object intended by its passage. In judging of the quality of a crop, and of its claims for premium, it is not the weight alone which enters into consideration. The mode of cultivation, the expense of the crop, the profit to be derived from it, the condition of the land, both before and after the crop; the time of seeding and of gathering, the uniformity of the crop throughout the field, all come into the true estimate of its value to the producer, and to the student of agriculture. These things must be judged of, not under legal compulsion, but by the intelligence of the committees called to view the crops, aided by such information as the farmer can readily bestow.

There seems to be no reason why, in obtaining this information, the business of the farmer should be interfered with. It may be impossible for him to weigh accurately the crop he enters. He may have no conveniences for such a purpose. He may be compelled by the weather to gather his crop in haste. It may be important for him to dispose of it, before the ascertaining of its weight would be of any service. He may be delayed in threshing (if a grain crop) beyond the time of decision. And the society with which he enters it may be obliged to hold extra sessions at unseasonable times, in order to declare its premiums; and when all is done, the most valuable part of the desired information is omitted.

The principle, moreover, is a bad one; and, if ever established, may lead to extremely troublesome legislation. It is impossible that any law can be passed applicable to all animals, crops, experiments, &c., for which premiums are offered by the various societies. They must be left to make their own regulations in these matters, according to the convenience and intelligence of each locality, and for the purpose of furnishing all the information in their power. The receipt of bounty from the State ought not to deprive them of that privilege and prerogative; inasmuch as the advantages to be derived from careful and particular legislation with regard to them may by no means compensate for the difficulties and troubles, and loss of interest which it may create.

There can be no doubt of the value of accuracy of information with regard to the agricultural products of the State. But no law can extract this from an unwilling people. A wide-spread, general interest is important to every society, and wherever this exists, much information can be obtained, which will be of value to every inquiring agriculturist. And this interest is considere to be one of the most important objects of our societies, an object which is in every way worthy of the fostering care of the Commonwealth.

The committee would recommend the following resolve:—

Resolved, That the fifteenth section of the Act relating to agricultural societies, chapter 66, p. 378, General Statutes, requiring the weight of all crops entered for premium, has proved to be burdensome on the one hand, and inoperative on the other; and that the State Board of Agriculture recommend its repeal, at the same time calling upon the several agricultural societies in the State to obtain accurate and careful information upon the various modes of cultivating crops, and to make systematic investigation into the amount produced, to be recorded in their annual reports.

George B. Loring, *Chairman*,
S. H. Bushnell.

The objection to the requirements of the law on the score of the extra labor on the part of competitors, has less weight than would appear at first sight, and so far as it has any weight at all, it may be met by an offer of larger and more liberal premiums on the part of the societies.

The time required to weigh an acre of corn, wheat, oats, rye or roots, on a small platform-scale, to be had temporarily from the neighboring store, would not necessarily be more than one hour, or at most, an hour and a half. For hay, if there were any occasion for it, as is very rarely the case, the difficulty is a little greater, as larger town scales would be required, and they might not be at hand; but the extra labor for all the small grains and roots is but trifling in the way indicated.

The Committee on Agricultural Education, appointed a year ago, having been authorized to obtain an Elementary Manual of Agriculture for the use of our common schools, made an arrangement with Messrs. George B. Emerson and Charles L. Flint, to prepare such a manual, to be submitted for approval to the Board. The Manual was submitted to the Board at an adjourned meeting, held on the 22d of January, and after a full and patient consideration, it was

Resolved, That this Board approve of the Manual of Agriculture, submitted by its authors, Messrs. George B. Emerson and Charles L. Flint, and recommend its publication by these gentlemen, as a work well adapted for use in the schools of Massachusetts.

THE STATE CABINET.

The efforts to increase the collection designed to illustrate the Natural History and Industrial Resources of the Commonwealth have been continued without interruption during the past year. It is important that this collection should be complete in all its departments, an object of pride and satisfaction to every citizen.

The contributions during the past year are as follows:—

MAMMALOGY.—W. H. FLOYD presented a specimen of the Silver-haired Bat (*Vespertilio noctivagans*).

This animal is not common in this State, but occurs frequently in Connecticut, and is common in the southern counties of New York. Its history is yet incomplete. It is black, with silvery hairs above and beneath; above, a whitish collar across the shoulders extends upwards towards the ears. The tail extends beyond the wing membranes. In common with the other species it takes refuge during the day in hollow trees.

Mr. Floyd also presented two specimens of the common Bat (*Vespertilio noveboracensis*), a specimen of the Hoary Bat (*Vespertilio pruinosus*), a specimen of the Star-nosed Mole (*Condylura cristata*), and a specimen of the Short-tailed Shrew (*Sorex brevicornis*).

Mr. Floyd also presented the skull of a cat and the skull of a woodchuck.

We would suggest that the value of a collection of skulls of the different animals and birds of the State in a cabinet like the Agricultural Museum connected with this department, is manifest, and it is hoped that in the coming year those who have the opportunity to forward such skulls as may be in their possession will please do so, and the donor's name will be attached to the specimens, and they will be arranged and named in a careful and scientific manner.

Maj. JAMES S. GRENNELL presented an albino Gray Squirrel (*Sciurus carolinensis*), and an old Woodchuck (*Arctomys monax*), with remarkably long and curved incisors.

F. G. SANBORN presented a specimen of the Red Squirrel (*Sciurus hudsonius*).

Miss C. M. F. presented a specimen of the common Rabbit (*Lepus sylvaticus*).

Col. CYRUS KNOX, of Palmer, presented a specimen of the Otter (*Lutra canadensis*), female. This animal is now quite rare in this State, although once quite plenty. This specimen is perfect and a valuable addition to the cabinet.

ORNITHOLOGY.—Many donations have been made in this department, and some exchanges effected for specimens which were desirable for supplying deficiencies in the different genera.

W. H. FLOYD presented a specimen of the Yellow-billed Cuckoo (*Coccygus americanus*), female, a specimen of the Hairy Woodpecker (*Picus villosus*), female. This bird is known by the popular name of Sapsucker, from a belief that it sucks the sap of trees. In looking at a fruit tree, for instance, we may frequently see a series of holes completely and regularly encircling the trunk, and which are made by this species. The popular notion is, that the bird makes these holes to suck out the sap. But this bird is very seldom seen in our orchards or about our dwellings in the summer months, when the sap is in the trunks and branches, but seeks the solitude of the forests, where it generally rears its young, and it makes its appearance in the orchards only in the latter part of autumn and winter.

The perforations in the bark are made by the bird in searching for insects and their larvæ and eggs, and its industry surpasses that of any of its tribe; it is always observed moving about the bodies of trees, or creeping along the branches, diligently at work dislodging the insects that are concealed between the bark and the wood. While thus engaged, it labors with much energy and activity, frequently spending several minutes at one spot, rather than suffer the vermin to continue their work of destruction unmolested. On such occasions it becomes so intent on its occupation as to allow one to approach quite near the scene of its operations, and it may sometimes be seen drawing out the larvæ from the holes it has made and swallowing them.

Mr. Floyd also presented a specimen of the Golden-crested Wren (*Regulus satrapa*), female; two specimens of the Cedar Bird (*Ampelis cedrorum*), immature; a specimen of the American Shrike (*Collyrio borealis*), female; two specimens of the Red-eyed Flycatcher (*Vireo olivaceus*), male and female; one specimen of Yellow-throated Flycatcher (*Vireo flavifrons*), male; a specimen of the Pine Grosbeak (*Pinicola canadensis*), female. This bird is quite rare in this State, being found so far South only in very severe winters.

Mr. Floyd also presented a specimen of the Red Crossbill (*Curvirostra americana*), young male; two specimens of the Bob-o-link (*Dolichonyx oryzivorus*), male and female; and one specimen of the Spotted Sandpiper (*Tringoides macularius*), young.

W. H. W. PERRY presented skins of the following birds: Sharp-shinned Hawk (*Accipiter fuscus*), female; Blackburnian Warbler (*Dendroica Blackburniæ*), male; Bay-breasted Warbler (*Dendroica castanea*); Canadian Flycatcher (*Myiodioctes canadensis*), female; Great Northern Shrike (*Collyrio borealis*), female; Pine Finch (*Chrysomitris pinus*), female, and Ruffed Grouse (*Bonasa umbellus*).

Col. E. GERRY presented a specimen of the Gos Hawk (*Astur atricapillus*), female.

OTIS PUTNAM presented a specimen of the Double Crested Cormorant (*Graculus dilophus*), female.

T. C. HASKELL presented a specimen of the Sky Lark (*Eremophila cornuta*), young female; also a specimen of the Crow Blackbird (*Quiscalus versicolor*), female; a specimen of the Woodcock (*Philohela minor*), and a specimen of the Little Auk.

HENRY A. PURDIE presented a specimen of the Maryland Yellow Throat, (*Goethlypis trichas*), female; a specimen of the Nashville Warbler (*Helminthophaga ruficapilla*); a specimen of the Black-throated Green Warbler (*Dendroica virens*), male; a specimen of the White-eyed Vireo (*Vireo noveboracensis*), and two specimens of the Yellow-throated Flycatcher (*Vireo flavifrons*).

E. A. SAMUELS presented a specimen of the White-eyed Flycatcher (*Vireo noveboracensis*), female.

F. G. SANBORN presented a specimen of the yellow warbler (*Dendroica æstiva*), female.

Maj. JAMES S. GRENNELL presented a specimen of an Albino Crow (*Corvus americanus*), quite rare, shot by AVERY BELL, of Greenfield; a specimen of the Green Heron (*Butorides virescens*), and a specimen of the Little Auk (*Mergulus alle*).

AMORY L. BABCOCK presented specimens of the Chimney Swallow (*Chætura pelasgia*); Night Hawk (*Chordeiles popetue*); King Bird (*Tyrannus carolinensis*); Least Flycatcher (*Empidonax minimus*); Yellow Rump (*Dendroica coronata*); Scarlet Tanager (*Pyranga rubra*); Barn Swallow (*Hirundo horreorum*); Red-eyed Flycatcher (*Vireo olivaceus*); American Creeper (*Certhia americana*), female; Yellow Bird (*Chrysomitris tristis*), female; Lesser Red Poll (*Aegiothus linaria*); Snow Bunting (*Plectrophanes nivalis*), and Swamp Blackbird (*Agelaius phœniceus*).

C. L. FLINT presented a apecimen of the Snow Goose (*Anser hyperboreus*), female. This bird was shot in Boston harbor, in July last. Although occasionally found here in the migrations, it is very rarely here at the season in which this was taken.

GEORGE E. EVERETT presented a specimen of the Little Auk (*Mergulus alle*).

J. H. HUNKINS presented a specimen of the Long-eared Owl (*Otus wilsonianus*). Shot on Boston Common.

E. LAKE presented a specimen of the Blue Jay (*Cyanura cristata*)

ICHTHYOLOGY.—But few additions have been made to this department during the past year. It is hoped that all interested in this enterprise will send in contributions and make this branch of Natural History fully equal to the other branches represented in the State cabinet. But little preparation is necessary before forwarding specimens. If they are to come but a short distance, the only preparation necessary is wrapping them in damp grass and boxing them securely with a slight aperture in the box cover: if the distance is great, place them in a box on powdered charcoal, sprinkle the same on them to the depth of half an inch, and fill the box with any thing dry and clean, (hay or shavings, for instance,) the specimens will be prepared, named and placed in the cabinet with the donor's name attached.

E. A. SAMUELS presented a specimen of the White Perch (*Labrax mucronatus*); a specimen of the Sea Raven (*Hemitripterus americanus*); a specimen of the Tautog (*Tautoga americana*); a specimen of the common Pickerel (*Esox reticulatus*); a specimen of the Bill Fish (*Scomberesox equirostrum*); a specimen of the common Brook Trout

(*Salmo fontinalis*), and a specimen of the Tom Cod (*Morrhua tomcodus*).

F. G. Sanborn presented a specimen of the Gold Fish (*Cyprinus auratus*), from Andover.

Herpetology.—Acknowledgements are due for the following donations to this department.

T. R. Webster presented a specimen of the Chicken Snake (*Coluber eximius*).

W. H. Floyd presented a specimen of the Spotted Tortoise (*Emys guttata*) ; a specimen of the Wood Tortoise (*Emys insculpta*) ; a specimen of the Snapping Tortoise (*Emys serpentina*), young ; and two specimens, male and female, of the Box Tortoise (*Cistuda carolina*).

Mr. Floyd also presented a specimen of the Ringed Snake (*Coluber punctatus*) ; several specimens of the Chicken Snake (*Coluber eximius*) ; a specimen of the Water Adder (*Coluber sipedon*) ; and a specimen of the Spotted-neck Snake (*Coluber occipito-maculatus*).

E. A. Samuels presented a specimen of the Spotted-neck Snake (*Coluber occipito-maculatus*) ; a specimen of the Pickering's Hylodes (*Hylodes pickeringii*) ; a specimen of the Red-backed Salamander (*Salamandra erythronota*) ; a specimen of the Symmetrical Salamander (*Salamandra symmetrica*), and a specimen of the Violet-colored Salamander (*Salamandra venenosa*).

J. H. & J. O. Treat presented a specimen of the Black Snake (*Coluber constrictor*).

Thomas Drew presented an upper half of the shell of a Snapping Tortoise (*Emys serpentina*).

Oology.—Henry A. Purdie presented nest and eggs of the Least Flycatcher (*Empidonax minimus*) ; three eggs of the Barn Swallow (*Hirundo horreorum*) ; two eggs of the Cliff Swallow (*Hirundo lunifrons*), and two eggs of the Field Sparrow (*Spizella pusilla*).

W. H. Floyd presented nest and egg of the Cooper's Hawk (*Accipiter cooperii*) ; nest of Least Flycatcher (*Empidonax minimus*) ; two nests and two eggs of the Maryland Yellow Throat (*Geothlypis trichas*) ; nest of Indigo Bird (*Cyanospiza cyanea*), nest and two eggs of the common Crow (*Corvus americanus*) ; and nest and eggs of Blue Jay (*Cyanura cristata*).

E. A. Samuels presented nest and eggs of the Snow Bird (*Junco hyemalis*). This nest is very rarely found and is a valuable addition to the collection.

Entomology.—The department of Entomology has been largely increased during the past season by donations and collections. Over fifty undescribed species of Lepidoptera have been added, and several hundred specimens of Coleoptera, Hemiptera, and Diptera, the results of the summer campaign are now in process of preparation for the cabinet. We have to acknowledge the receipt, from Mr. DENIS MURRAY, of Roxbury, of a large number of valuable specimens, some of them exceedingly rare. Among them several cocoons of *Attacus Cecropia*, containing larva of parasitic ichneumon flies; three specimens of *Cordiceps Carolinensis*, growing from the larva of *Elater communis*, the "*wire worm;*" a number of warts from the plum tree, caused by *Sphæria morbosa*, and containing larvæ of *Ægeria exitiosa*, some of which passed through their transformations and produced the imago after being deposited in the cabinet, and specimens of *Cetonia Inda*, galls of *Cynips seminator*, and other gall-producing insects, among which is a new gall upon twigs of the grape apparently produced by a dipterous insect, but which has not yet arrived at maturity. Mr. M. also presented a great variety of scarce fungi, which will serve as a nucleus for a collection of that class of plants.

Mr. JAMES FLINT, of Reading, presented a nest of the common hornet, or paper-making wasp, *Vespa crabro*, suspended from a long shoot of birch one-eighth of an inch in diameter, two very fine specimens of *Gryllotalpa brevipennis*, the "mole-cricket," and a specimen of *Spectrum femoratum*, the "walking-stick insect."

From Dr. BRIGGS, of Abington, we have received a fine specimen of *Dryocampa imperialis*, female; one of *Gastropacha Americana*, *Chauliodes pectinicornis*, *Saturnia Io*, *Spectrum femoratum*, and an undescribed species of *Pygæra*.

From NATHAN WYMAN, Esq., of Woburn, several cocoons of *Attacus Cecropia*, and *Promethens*.

From WILLIAM H. FLOYD, of Weston, small pear-shaped nest of the paper-making wasp, cocoons of *Attacus Cecropia*, and *Prometheus*, and various alcoholic specimens.

From PAOLI LATHROP, Esq., specimens of larvæ and pupæ of *Eurytoma hordei* in stalks of rye.

From WM. F. POOLE, Esq., specimens of *Saperda bivittata*, and larva in a block of apple tree.

From NAHUM SMITH, Esq., Weston, specimens of *Tremex Columba* in walnut tree.

From W. O. HASKELL, Esq., of Chelsea, specimens of *Corydalis cornutus*, and *Cicada pruinosa*.

From CHARLES HERBERT, of Rowley, a fine large specimen of hornet's nest on thorn tree.

From DANIEL PERHAM, Esq., Tyngsboro', specimen of *Spectrum femoratum*, walking-stick insect.

From Rev. E. D. Moore, a very fine specimen of *Hemerobius irroratus.*

From David Pulsifer, Esq., of Chelsea, specimens of *Cicada pruinosa*, *Lucanus dama*, &c.

From Joseph R. French, Esq., of Andover, a fine specimen of the green swallow-tailed moth, female, *Attacus Luna.*

From Edward C. Wood, of N. Bridgewater, a box of insects, containing some forty specimens.

From Francis Stowell, of Concord, a box of insects, about twelve specimens.

From G. Pike, Andover, several specimens of *Noctuidæ* and *Bombycidæ.*

From James Coverly, Esq., Winter Street, Boston, a specimen of Tremex, which, being in the pupa state in a block of wood, turned for the purpose of rolling ribbon, had eaten its way out through several yards of ribbon, destroying the whole piece, or at least producing a perforated pattern that is in very little demand in the market.

Miscellaneous.—Many donations of a miscellaneous character have been made.

Hon. Oliver Warner presented, from the Board of Managers, a piece of the Washington Monument.

J. Osgood, of Marlboro', presented specimens of Wheat and Flour.

James Flint presented specimens of warts from cattle, three or four inches in diameter.

G. Raymond presented two stone chisels, Indian relics.

Joseph Bird presented a model of his excellent garden and fire engine.

G. M. Atwater presented specimens of corn of different varieties.

In compliance with numerous requests, we publish a list of the birds found in this State, but not yet placed in the Cabinet. Those marked thus *, are rare in this State.

Cooper's Hawk, (*Accipiter cooperii*), male and female.
Sharp-shinned Hawk, (*Accipiter fuscus*), female.
Red-tailed Hawk, (*Buteo borealis*), female.
Rough-legged Hawk, (*Archibuteo lagopus*), male.
Black Hawk,* (*Archibuteo sancti-johannis*), female.
Golden Eagle,* (*Aquila canadensis*), male.
White-headed Eagle, (*Haliætus leucocephalus*), male and female.
Barn Owl,* (*Strix pratincola*), male and female.
Long-eared Owl, (*Otus wilsonianus*), male.

Short-eared Owl. (*Brachyotus cassinii*), male and female.

Great Gray Owl,* (*Syrnium cinereum*), male and female.

Barred Owl, *Syrnium nebulosum*), male.

Tengmalm's* Owl, (*Nyctale richardsoni*), male and female.

Saw-whet Owl, (*Nyctale acadica*), male.

Hawk Owl,* (*Surnia ulula*), male and female.

Black-backed, three-toed Woodpecker,* (*Picoides arcticus*), male and female.

Banded three-toed Woodpecker,* (*Picoides hirsutus*), male and female.

Yellow-bellied Woodpecker,* (*Sphyrapicus varius*), male and female.

Ruby-throated Humming Bird, (*Trochilus colubris*), male and female.

Whippoorwill. (*Antrostomus vociferus*), male.

King Bird, (*Tyrannus carolinensis*), female.

Great-crested Flycatcher, (*Myiarchus crinitus*), female.

Pewee, (*Sayornis fuscus*), male and female.

Olive-sided Flycatcher, (*Contopus borealis*), female.

Wood Pewee, (*Contopus virens*). female.

Traill's Flycatcher,* (*Empidonax traillii*), male and female.

Least Flycatcher, (*Empidonax minimus*), male and female.

Ruby-crowned Wren, (*Regulus calendula*), male and female.

Tit Lark, (*Anthus ludovicianus*), male and female.

Maryland Yellow-throat, (*Geothlypis trichas*), female.

Connecticut Warbler,* (*Oporonis agilis*), male and female.

Worm-eating Warbler,* (*Helmitherus vermivorus*), male and female.

Golden Crowned Thrush, (*Seiurus aurocapillus*), male and female.

Black-throated Blue Warbler, (*Dendroica nigrescens*), female.

Blackburnian Warbler, (*Dendroica blackburniæ*), male and female.

Bay-breasted* Warbler, (*Dendroica castanea*), male and female.

Black and Yellow Warbler,* (*Dendroica maculosa*), female.

Cape May Warbler,* (*Dendroica tigrina*), male and female.

Prairie Warbler, (*Dendroica discolor*), female.

Red Start, (*Setophaga ruticilla*), male and female.

Summer Red Bird,* (*Pyranga æstiva*), male and female.

Barn Swallow, (*Hirundo horreorum*), female.

White-bellied Swallow, (*Hirundo bicolor*), male and female.

Bank Swallow, (*Cotyle riparia*), male and female.

Rough-winged Swallow,* (*Cotyle serripennis*), male and female.

Purple Martin, (*Progne purpurea*), female.

Wax-wing Bohemian Chatterer,* (*Ampelis garrulus*), male and female.

Red-eyed Flycatcher, (*Vireo olivaceus*), male and female.

White-eyed Flycatcher, (*Vireo noveboracensis*), male and female.

Blue-headed Flycatcher, (*Vireo solitarius*), female.

Yellow-throated Flycatcher, (*Vireo flavifrons*), male and female.

Brown Thrush, (*Harporhynchus rufus*), female.
Long-billed Marsh Wren, (*Cistothorus palustris*), male and female.
House Wren, (*Troglodytes ædon*), male and female.
Wood Wren,* (*Troglodytes americanus*), male and female.
Winter Wren, (*Troglodytes hyemalis*), male and female.
White-bellied Nuthatch, (*Sitta carolinensis*,) female.
Red-bellied Nuthatch, (*Sitta canadensis*), female.
Black-cap Titmouse, (*Parus atricapillus*), female.
Pine Grosbeak, (*Pinicola canadensis*), male.
Grass Finch, (*Pooecetes gramineus*), female.
Yellow-winged Sparrow, (*Coturniculus passerinus*), female.
Henslow's Bunting,* (*Coturniculus henslowi*), male and female.
White-crowned Sparrow (*Zonotrichia leucophrys*), male and female.
White-throated Sparrow (*Zonotrichia albicollis*), female.
Tree Sparrow (*Spizella monticola*), female.
Swamp Sparrow (*Melospiza palustris*), female.
Indigo Bird (*Cyanospiza cyanea*), female.
Ground Robin (*Pipilo erythrophthalmus*), female.
American Raven* (*Corvus carnivorus*), male.
Fish Crow* (*Corvus ossifragus*), male and female.
Wild Turkey* (*Meleagris galloparo.*)
Quail (*Ortyx virginianus*), male and female.
White Heron* (*Herodias egretta*), male and female.
Least Bittern,* (*Ardetta exilis*), male.
Green Heron (*Butorides virescens*), female.
Night Heron (*Nyctiardea gardeni*), female.
Golden Plover (*Charadrius virginicus*), male.
Kill-deer (*Aegialitis vociferus*), male and female.
Wilson's Plover* (*Aegialitis wilsonius*), male and female.
Semipalmated Plover (*Aegialitis semipalmatus*), male and female.
Black-bellied Plover (*Squatarola helvetica*), male and female.
Oyster Catcher* (*Hæmatopus palliatus*), male and female.
Turnstone (*Strepsilas interpres*), female.
American Avoset* (*Recurvirostra americana*), male and female.
Wilson's Phalarope* (*Phalaropus wilsonii*), male and female.
Northern Phalarope* (*Phalaropus hyperboreus*), male and female
Red Phalarope* (*Phalaropus fulicarius*), male and female.
Gray Back (*Tringa canutus*), male and female.
Purple Sandpiper (*Tringa maritima*), male and female.
Red-backed Sandpiper (*Tringa alpina*), female.
Least Sandpiper or Peep (*Tringa wilsonii*), male and female.
Willet, (*Symphemia semipalmata*), female.
Tell Tale (*Gambetta melanoleuca*), female.

Yellow Legs (*Rhyacophilus solitarius*), female.
Marbled Godwit* (*Limosa fedoa*), male and female.
Hudsonian Godwit,* (*Limosa hudsonica*), male and female.
Long-billed Curlew* (*Numenius longirostris*), female
Short-billed Curlew* (*Numenius hudsonicus*), male and female.
Esquimaux Curlew* (*Numenius borealis*), male and female.
Virginia Rail (*Rallus virginianus*), male and female.
Yellow Rail* (*Porzana noveboracencis*,) male and female.
Purple Gallinule* (*Gallinula martinica*), male and female.
Snow Goose (*Anser hyperboreus*), male.
Brant, (*Bernicla brenta*), female.
Mallard, (*Anas boschas*), male and female.
Pintail, (*Dafila acuta*), female.
Green-winged Teal (*Nettion carolinensis*), male and female.
Blue-winged Teal (*Querquedula discors*), female.
Shoveller (*Spatula clypeata*), female.
Gadwall* (*Chaulelasmus streperus*), male and female.
American Widgeon (*Marecu americana*), male and female.
Summer Duck (*Aix sponsa*), female.
Scaup Duck (*Fulix marila*), female.
Red Head (*Aythya americana*), female.
Canvas-back Duck* (*Aythya vallisneria*), male and female.
Golden-eye Whistler (*Bucephala americana*), female.
Goosander (*Mergus americanus*), male and female.
Red-breasted Merganser (*Mergus serrator*), female.
Leach's Petrel* (*Thalassidroma leachii*), male and female.
Pomarine Skua* (*Stercorarius pomarinus*), male and female.
Arctic Skua* (*Stercorarius parasiticus*), male.
Herring Gull (*Larus argentatus*), female.
Laughing Gull (*Chroicocephalus atricilla*), male and female.
Kittiwake Gull (*Rissa tridactyla*), male and female.
Least Tern (*Sterna frenata*), female.
Double-crested Cormorant (*Graculus dilophus*), male and female.
Red-throated Diver* (*Colymbus septentrionalis*), male and female.
Horned Grebe (*Podiceps cornutus*), male and female.
Guillemot (*Uria grylle*), male and female.
Foolish Guillemot (*Uria lomvia*), female.

The State Agricultural Library, connected with my office, has received many valuable accessions during the past year, and is now one of the largest, if not one of the best selected, agricultural libraries in the United States. The collection of works on the Honey Bee is believed to be the best and most extensive in the country. Most of the additions have been by purchase. Acknowledgments are due to Mr. G. Howland Shaw, who presented to the library a copy of the "*Description des Espèces Bovine*," &c., volume 1, published by the French Government, and to Gen. H. K. Oliver, for a copy of a *Treatise on Agriculture and Rural Affairs*, by Robert Brown, two volumes, Edinburgh, 1811.

By an Act of the legislature of 1859, I was directed to publish a new and illustrated edition of Harris' valuable "Treatise on Insects Injurious to Vegetation." No pains have been spared to make it a model of its kind in every respect. The most eminent entomologists of the country have voluntarily contributed to its perfection by way of notes, and the services of the most talented artists have been secured to illustrate and adorn its pages. This work is now in press, and will be issued during the ensuing summer, in a manner highly creditable to the Commonwealth. Fifteen copies are placed at the disposal of each of the agricultural societies, to be awarded in premiums.

In conclusion, it is proper to state that since my last Annual Report two new societies have been incorporated, making the number now receiving the bounty of the Commonwealth twenty-five. All are in a prosperous condition, notwithstanding the fact that the exhibitions of the past year suffered from the absence of neat stock, which was excluded on account of the prevalence of the disease commonly known as pleuro-pneumonia. This exclusion was regretted by some who were not fully informed with regard to the alarming character of the disease. But it should be borne in mind that under the circumstances then existing, and with the possibility that by collecting large numbers of cattle the disease might be spread, a proper regard to public safety demanded their exclusion, and any other course might have been suicidal.

The details of the operations of the commissioners appointed to exterminate that disease are to be found on a preceding page, but it may be proper to state that since the report of the commissioners was presented, the last of the cattle known to have been exposed have been destroyed, and the result showed most conclusively the wisdom of this course, a considerable portion of them having been found badly diseased. The community may now feel a degree of security which would not have existed under any other circumstances, but the experience of the past year shows the importance and necessity of rigid quarantine regulations with regard to the admission of foreign cattle. Such regulations have existed for years in the kingdom of Norway, and that country has enjoyed a perfect immunity from this terrible scourge, till, during the past season, exception was made by the government in favor of some Ayrshire cattle imported for the farm of the Royal Agricultural College. These cattle were landed in August, and carried the pleuro-pneumonia, so called, and on the 20th of December last, thirty, out of the sixty head, had died or been killed, and others were still diseased, an experience strikingly similar to our own.

With the exception of the misfortune above alluded to, the past year has been one of marked prosperity, most of the crops of the farm being fully up to the average of years, while the abundance and yield of fruits, wheat, barley, oats and rye, were wholly unprecedented in the history of our agriculture. May the enterprise, thrift and skill of the farmers of this Commonwealth be always rewarded by similar generous harvests!

CHARLES L. FLINT,
Secretary of the State Board of Agriculture.

Boston, January 23, 1861.

REPORTS OF DELEGATES

APPOINTED TO VISIT THE

AGRICULTURAL EXHIBITIONS.

ESSEX.

attended the annual exhibition of this society which was held at South Danvers on the 25th and 26th of September. The trustees of the society had complied with the precautionary recommendation of the Board, and had declined to have an exhibition of neat stock. The show of live stock was, therefore, confined principally to horses and sheep, of which there was a fair show, with probably as good specimens as are exhibited anywhere in the State. But I hope the day will soon come when we may see at our cattle shows entries of sheep, which will rival in variety and in the number of those who compete for the premiums, the shows of neat stock, which have heretofore engrossed so large a share of the exhibitions of this society. Mr. Richard S. Fay exhibited some of his Oxford Downs, and a Shearling buck of this breed, just imported, which weighed two hundred and fifty pounds. I also noticed a Cotswold buck of average size and appearance for its breed, which, I was surprised to learn, was awarded the first premium. I notice in the premium lists of many of our societies that a premium is offered "for the best buck, of any breed," "for the best bull, of any breed, &c." Now, although it may perhaps be urged by some farmers that they can select the best animal in a lot of various breeds, it must still be remembered that no just comparison can be made between the best specimens of different breeds, for the purposes of a premium. They are raised for different purposes and have, therefore, different qualities and points. No comparison can be made between a Merino buck and Leicester ram, a Jersey bull and a Short-horn, any more than between a pony and a draught horse, or a bantam and a turkey : and our societies should be the more careful to lead committees to make just discriminations, when they perceive that committees overlook distinctions and are inclined to award a first premium to the largest animal.

The ploughing match with horses, in which there were, I think, fifteen competitors, was one of the most interesting and instructive portions of this exhibition, and it may well be asserted that the loss of neat cattle at this exhibition, and perhaps the cattle disease itself may be fully compensated if the farmers of Essex shall be induced to use horses more extensively for all the purposes of the farm. And here, also, I am aware that I am opposing, to a great extent, the well-settled convictions of many of our best farmers and closest calculators, who think that it will never do to plough with horses. As our country becomes better cultivated, our farms smoother, and our land more enriched and oftener turned from the sod, and the whole business of the farmer more systematized and confined to his business, our farmers will learn what the experience of England has taught her farmers long ago, that the ox is the most expensive animal upon the farm. What is lost in depreciation and risk of accident and disease by the use of the horse, is made up in celerity of motion and adaptation to market business.

But whether these considerations are true or not, it should be the policy of our societies to offer premiums for those departments and modes of husbandry which most need encouragement. We have great doubts whether there is any better ploughing with oxen now, or any more oats raised, than ten or twenty years ago, by reason of premiums for these objects. If the cultivation of wheat be desirable in Massachusetts let large premiums be offered for wheat crops, and if it is well settled that we should have pure blooded, until the quality of our stock is raised much higher than the present average, the society should offer a premium for a grade or mongrel bull.

The show of horses was choice, and showed much attention to the breeding of those animals. The most valuable animals on exhibition were descendants of Vermont Black Hawk through Trotting Childers, owned and kept by Lambert Maynard, Esq., of Bradford. A five-year-old stallion, Doncaster, sired by Childers, and owned by Dr. George B. Loring, attracted much attention, by his style and speed. He is of medium size, great strength, and is in every respect a valuable addition to the stock of the country. A four-year-old filly, sired also by Childers, also exhibited by Dr. Loring, was worthy of the attention of horse breeders. A two-year-old stallion, Bunker Hill, sired by Doncaster, also exhibited by Dr. Loring, was evidently a well-bred and powerful animal. A valuable St. Lawrence stallion was exhibited by Mr. Boynton, of Georgetown, and showed such speed and power as to receive special attention of the committee on these animals. In addition to these were Messenger horses of fine size, and evidently adapted to the service of the farmer. The breeding of horses has evidently received much attention from the agriculturists of Essex County, who have endeavored to raise such animals as will be profitable to the producer.

It is worthy of notice that this society, one of the oldest and most flourishing in the State, supported by most zealous and enlightened farmers, continues its practice of changing its place of exhibition from year to year in order to accommodate every section of this large county. The unity and interest of a show is greatly increased by confining all its departments to a single enclosure. But if the consequence of locating these exhibitions within a single enclosure in some central town, shall be a division of the county into several sectional societies, and a loss of general interest in the parent society, it is all important that the present plan of the society be continued. But the advantages of holding the cattle shows within an enclosure are so great that I indulge the hope that the society may yet be enabled to hold grounds of its own in two or three parts of the county, at which its exhibitions may be held in successive years. By all means let old Essex confine its efforts to a single society. Let not the county interest, and the brotherly feeling, which late legislation has done so much to dissolve, be further abated by the incorporation of another society.

The exhibition of fruits was especially noticeable. There were eleven hundred plates devoted to fruit alone.

An address by Rev. John L. Russell, and a dinner, closed an exhibition which was remarkably successful under discouraging circumstances, as the first afternoon was lost in a flood of rain, and the second day was graced by a most boisterous gale.

CHARLES G. DAVIS.

MIDDLESEX.

As a delegate from the State Board of Agriculture, I attended the sixty-eighth annual exhibition of the Middlesex Society, holden at Concord, on the 20th of September. And although I was pleased and highly entertained by some portions of the show, I was not, as a whole, very favorably impressed by it. Fears of the cattle scourge prevented the exhibition of neat stock, and the horses, though respectable in numbers, looked mean, and I doubt not looked as they felt, for being compelled to exhibit themselves in a pouring rain. In the department of breeding mares and colts the show was good, indicating that the members of the society are interested and successful in this branch of stock raising. A ploughing match by seven competitors, was entered into with spirit, and excellent work performed in spite of the weather; but spectators seemed to prefer shelter from the storm, rather than the excitement and instruction of the trial, and a thorough drenching. A majority of the instruments used were the Michigan double plough, and I conclude by it, that deep, thorough pulverizing of the soil, is a cardinal doctrine of the farmers of Middlesex. Of swine there were but two entries; but two animals on the ground, and these not for breeding purposes, but for the butcher. Sheep there were none, but poultry were respectable in numbers, and excellent in quality. I noticed some most beautiful geese of the Bremen variety.

In the department of mechanics the show was meagre. The cash sheet of the society showed that the number of spectators on the ground was small compared with former years. But the inclement weather drove them to the hall, which was full to overflowing, not only with spectators, but with fruit and grain, vegetables, bread, butter, cheese, and specimens of the handiwork of the industrious women of the society, in both the ornamental and useful line. The exhibition of flowers and fruits was of a high order, especially in the department of apples and grapes. The weather, though injurious to the interest of the society, was treated as a capital joke; the greatest good feeling and hilarity prevailed. The occasion was enlivened by Gilmore's brass band, that gave snatches of melody in the open air during the occasional gleams of sunshine, but who, unlike the ploughmen, made a precipitate retreat to the hall when the rain clouds swept by. The society had no public dinner, but listened in large numbers and with apparent interest and satisfaction to an excellent address from one of the citizens of Concord, Mr. Thoreau. The address was an answer to the question, "Why, when a pine forest is cut down, does a hard wood forest take its place?" In answering this, the speaker showed clearly the necessity of rotation of crops, the great vitality of seeds under favorable circumstances, and the means nature had provided for scattering and planting the seeds of trees and plants. President Felton, of Harvard College, made a pithy speech, contrasting the customs and methods of farming in the olden time with those of the present day, and urged a higher culture as the means of still greater advancement. Hon. Charles Hudson, of Lexington, spoke of the value and importance of agriculture to the State, and urged the necessity of its being fostered and encouraged.

At the conclusion of these exercises, the annual meeting of the society was holden; a new board of officers elected, the report of the treasurer, showing the financial affairs of the society to be prosperous, was presented and accepted, and the awards of the various examining committees made known.

As has been already intimated, the show of the Middlesex Society did not, as a whole, realize my expectations; but the State bounty has not been by any means misapplied or wasted. The partial failure was owing to causes over which the officers or members had no control. Rainy days, or years of pleuro-pneumonia, may again occur, but the beneficial stimulus of the State money will be seen, as this season, in the encouragement it gives to those branches of agriculture that require the year for illustration rather than the day of exhibition. This society is much more limited at the present time, in its field of operations, than during the years of its early history. The incorporation of the Middlesex North, at Lowell, and South, at Framingham, have somewhat localized it to the middle of the county, but its premium list is open to competitors within the county limits, and numbers avail themselves of the privilege. Middlesex County is one of the best, if not the best county in the State, for successful, prosperous husbandry. Its large manufacturing and mercantile population make it a perfect beehive. Consumers greatly outnumber producers, and the home market, which demands all the products of the soil at highly remunerative prices, encourages the farmers to exertions to meet the call. As a consequence, the lucrative business of market gardening is largely engaged in. Of roots and esculent vegetables, this county, according to the statistics of 1855, raises more than all the other counties of the State, and it is entitled to the appellation of the garden of Massachusetts.

In closing this report, I wish to call the attention of the Board to a transaction that occurred on the grounds of this society, near the closing hours of its last exhibition. An intoxicated Irishman, in a fit of drunken frenzy, with a dangerous weapon stabbed two men severely, and, as was feared at the time, fatally. For this occurrence the officers or members of the society were not culpable. General good order prevailed, and the offenders in this brawl were promptly arrested. It is a question whether our societies are sufficiently guarded and empowered by legislation, to protect themselves from scenes of a similar character. We desire these annual exhibitions to be holidays to the entire community; but good order, sobriety, and decorum should be the law of conduct. We wish our families, our wives and children to attend them; and it is imperative that they should not be made thereby the witnesses of scenes that shock the finer sensibilities, or be brought in contact with any thing contaminating to purity and morality. At such large gatherings the refuse of society are prone to congregate, with no laudable object in view, and the officers of the societies should have legal powers to prevent all drunkenness and debauchery, wantonness or rioting, on or about their exhibition grounds. If the laws are already sufficient, they should be enforced with promptness and energy; if not, we should forthwith seek the enactment of such as will accomplish the desired end.

LEVI STOCKBRIDGE.

MIDDLESEX NORTH.

The exhibition of the Middlesex North Agricultural Society took place at Lowell on the day fixed by law, and in most particulars, it was a perfect success.

It would be difficult, I think, to collect in any part of the State, a larger or richer display of fruits and vegetables than that which loaded the tables in the large exhibition hall in the Society's building, although the tempestuous weather of the day preceding the show, prevented contributors from conveying their specimens to the hall at the time required by the rules of the society, in consequence of which a little less promptness than usual was apparent in carrying out the different parts of the programme, as the work of reception and arranging the articles for exhibition, usually performed during the day preceding that on which the grounds are opened for the public, was crowded into a few hours in the morning. The exhibition of stock was small, as owners from a distance, who are obliged to drive their cattle to the pens during the night, were prevented by the storm from any attempt to perform an act which would have been cruel to the animals and unprofitable to their owners. During the past year the society has erected a model building for its purposes, which for convenience and size is not excelled by any in the State. It is built in the form of a cross, two stories in height, well lighted with gas, and contains in one of its wings a well-finished tenement, occupied by the superintendent of the grounds. The society's dinner was served in the upper hall, which afforded abundant room for the large company drawn together by the high reputation of the orator of the day, ex-governor Banks, who after the dinner fixed the close attention of his auditors for a long period, by an able address.

The absence of any delegate from the Board of Agriculture was regretted, as the society would have been glad of any suggestions by which its exhibition could be improved.

Upon the whole the occasion was more successful than any of its predecessors, and the society will soon be one of the strongest in the State.

JOHN C. BARTLETT.

MIDDLESEX SOUTH.

Agreeably to appointment, I attended the annual fair of the Middlesex South Agricultural Society, held on the 18th and 19th of September. The weather was fine on both days. I was very much disappointed in not seeing any of their fine cattle on the ground, as I profess to be somewhat of a cattle-man, having been brought up from my earliest recollections to raising cattle and sheep. Of the former there were none on exhibition, on account of the prevalence of the cattle disease in some portions of the State, which, notwithstanding my disappointment, I consider the wise course. To account for the absence of the latter is not so easy a matter, for from my observation of the country, I should think it was excellent for the raising of sheep, especially the mutton varieties, with profit, being easily accessible to market. I suppose the raising of sheep for wool might not be so profitable on account of the high price of land. There was, however, one yoke of lambs hitched to a wagon, driven by a little boy, which attracted about as much attention as any thing on the ground.

I was in a measure consoled for the disappointment of not seeing cattle on the exhibition grounds, by the pleasure I had in examining the fine herd of Ayrshires on the farm of Mr. H. H. Peters, of Southborough, with whom I staid during the fair, and with the manner in which he conducted his farming operations, which is worthy of imitation, as also by the privilege of viewing the Devon stock of Mr. Buckminster, of Framingham.

Of horses, there were forty on exhibition, including colts, and some very fine ones ; but not being a connoisseur in horse flesh, I will not enlarge on the subject ; but would say, though not a fast horseman, that I think they need a track of some kind to show their horses on, as it seems to me, to show the good qualities of a horse, especially roadsters, on grass ground, and that somewhat uneven, is not quite the thing.

Of swine, there were twenty-one entries, and all good specimens. I have rarely seen them excelled. They were most of them very fine in bone, and some of them of large size, which is not common with the finest varieties. Joseph Burnett, of Southborough, exhibited several, which for size and fine proportions, are not easily beaten.

There were twenty-eight entries of fowls. In this department the show was excellent, and seemed to possess more interest than in stock-raising localities.

The show in the hall was large, and the articles various and of good quality.

The show of fruit was large and excellent, and the varieties and specimens of the same variety were altogether too numerous to particularize. They consisted of two hundred and forty-six entries.

The show of vegetables was also large, comprising one hundred and sixty entries. The specimens shown by Mr. Lewis, of Framingham, showed he had a happy faculty in persuading Mother Earth to bestow her bounty upon him.

The show of bread was the largest, I think, I ever saw, and the quality appeared good.

One thing I noticed, in connection with the show of bread, that was peculiarly gratifying. This was, that a large number of the specimens on exhibition were made by girls from eight to sixteen years of age, showing that they were brought up to one good thing, at least, and such accomplishments are not apt to be alone. It is one that can be appreciated by at least the male portion of the community, and one of the utmost importance to the health of mankind.

Fancy articles were numerous and beautiful, consisting of one hundred and six entries, which showed that the female portion of the community had sufficient taste for the beautiful and elegant, which is a pretty sure index of refinement.

Of miscellaneous articles there were seventeen entries, among which were some splendid paintings.

Of articles manufactured from leather, there were nine entries. Jellies and preserves thirty-four, some of which looked very tempting to the palate.

Also, four varieties of fruit seedlings. The seedling grapes of Mr. Clark were delicious, as I can testify from a specimen he presented me.

Agricultural implements entered, seventeen, besides several professedly labor-saving machines.

Grain, three entries. Reclaimed meadow, one.

There were six entries for ploughing, which took place the morning of the second day, of which I cannot speak, as it was performed before I arrived.

The first day was mainly spent in the entering and arranging the articles for exhibition, and partaking of an excellent dinner in the upper room of the hall, got up by the ladies for the benefit of the society.

The second day the committees attended to their duties, and after a dinner, to which several were invited, provided by the hospitality of the president at his house, we marched to music by the band into the upper room of the hall, where we listened to an excellent and instructive address by the Hon. Mr. Bullock, of Worcester. Subject, the model state, and proper division of labor. England, he considered the nearest to a perfect model state, and Massachusetts next. After which we listened to music and to speeches from persons present, in the midst of which I left for the cars.

In closing this report, I cannot refrain from acknowledging the kind attentions of Mr. Peters and lady, at whose residence I passed the nights of the 17th and 18th, and where I witnessed some of the effects of thorough farming, on a naturally rough and stony soil, and must say that he thoroughly understands the process of making the rough places plain and practices it also.

MATTHEW SMITH.

WORCESTER.

The annual exhibition of this society was held at the show-grounds in the city of Worcester. In the absence of cattle, the attention of the visitor was necessarily turned to the collection of articles of manufacture, and specimens of crops in the hall, and to the display of horses on the ground. Of sheep and swine, but few were exhibited.

The samples of wheat placed before your delegate, from the lots presented by John Brooks, Jr., of Princeton, J. C. Jaques, of Worcester, D. F. Parmenter, of Holden, and T. B. Robinson, of Barre, were remarkably fine. From the statements made, it appears that from twenty-three and one-quarter to forty-two bushels of this grain had been raised to the acre, and that much attention is given to the introduction of the crop into the county. As a staple of agriculture, no one can doubt its importance;

and the recent indications that it can be raised successfully in our State, should commend it to every farmer.

A specimen of oats, from the farm of T. D. Robinson, of Worcester, raised at the rate of sixty-nine bushels to the acre, attracted much attention. In a district, however, capable of yielding good crops of wheat and rye, it is doubtful whether oats can be considered a profitable grain for the farmer.

The exhibition of root crops was very creditable, indicating a readiness to investigate that much-debated branch of agriculture. The Yellow Globe mangolds of John Brooks, Jr., of Princeton, and the ruta-bagas, and carrots, and sugar beets of Harvey Dodge, of Sutton, indicated careful cultivation, and a belief in the minds of two of the best farmers in the county, that roots can be advantageously raised.

The show of fruit was small, but it gave evidence of care and skill, especially in the production of apples.

The agricultural implements on exhibition were fully up to what your delegate had a right to expect of Worcester, the seat of so large a manufacture of articles of this description. Ploughs, mowing machines, horse hoes, and the smaller farming tools of every kind, made up one of the most attractive collections. The mowing machines were Ketchum's, the Buckeye, and Manny's, with the latest improvements in each, and each having admirers of its own peculiar excellence. Among all the inventions, will not some one construct a good root-cutter?

The dairy products were excellent.

Your delegate has not seen at any county show so large and interesting a variety of horses as were exhibited at Worcester. The blood of Cassius M. Clay was well represented in the large and rangy colt of Mr. Thorndike. Joseph Burnett, of Southborough, exhibited fine specimens of the Black Hawk, Morgan and Balrownie stock, and as he has bred from a very valuable mare, each of these strains of blood will have an excellent opportunity to prove its comparative merits for New England purposes. One or two good colts, sired by Ethan Allen, were also exhibited. A very instructive selection of colts from Trotting Childers, Cassius M. Clay, Ethan Allen, The North Horse, and Green Mountain Morgan, could have been made from the animals exhibited. It was noticed that size had very considerable weight in the minds of the committee who awarded the premiums. Perhaps it should be remembered that quality is very desirable, especially in a stallion. The most valuable stock-getters, such as Justin Morgan, and Black Hawk, have been small horses; and the great merit of Sir Henry, and Flora Temple, both less than fifteen hands high, never consisted in their size.

The affairs of the society, according to the statement of its officers, seem to be in an improving condition. The ample and beautifully-located grounds which it possesses, certainly present all the attractions which can possibly appertain to a fixed place of exhibition. And there is no doubt that the experience of this society, above all others, might be of great service to those which are proposing to adopt a similar plan, instead of the itinerary method now followed in some of the counties in this State.

George B. Loring.

WORCESTER WEST.

Your delegate, by direction of the Board of Agriculture, attended the exhibition of this society, at Barre, on the 29th day of September, and reports as follows:—

The day was a fine and cool autumn day, well adapted to ploughing, draught and equestrian exercises. There was a very large attendance, and the people seemed to enter into the spirit of their annual festival with all their heart.

I found, with some difficulty, the field laid out for the ploughing match, which was at some distance from the village, where three teams, of two horses each, were entered for the premium on ploughing.

The ground was a rather loose gravel, and the sward was new; notwithstanding these unfavorable circumstances the ploughing was well executed, and in good time. The ploughs were Ruggles, Nourse & Mason's No. 7 Eagle—which seems to be the favorite plough in this vicinity—the shortest time was 30 minutes 45 seconds; the longest 33 minutes; the depth of furrow 7 inches; the area ploughed one-eighth of an acre. The horses were obviously well broken to the work, and the ploughing seemed to me as well done as it could have been by oxen.

Owing to the prevalence of the cattle disease, there was no exhibition of the fine cattle of which the farmers of this vicinity are so justly proud, this part of the State having a great reputation in this respect; but there was exhibited a large quantity of the finest cheese, which I know by experience brings the highest price in the market. There was not so much butter shown, nor was it of the same superior quality as the cheese, although good. I promised myself the pleasure of visiting some of the fine herds owned in this vicinity, but want of time compelled me to postpone this gratification to the future.

Three or four military bands had come into town and enlivened the occasion with their fine music, and, in my judgment, added very much to the pleasures of the fair. I would suggest to other societies the propriety of adding this feature to their exhibitions, both as cultivating the love of music in the people and satisfying that love of excitement incident to such occasions, which is prone to seek other and more objectionable modes of gratification.

Having given up the exhibition of cattle, a large premium had been offered for the best cavalcade of horses. Large numbers came in from the neighboring towns, and it is not perhaps too much to say that a large proportion of them could not have been excelled in any part of the State; this was especially true of horses owned by the president of the society and ridden by ladies of his family.

Your delegate would especially commend this feature—riding by the ladies — to the notice of our agricultural societies. Nothing tends more to promote health, vigor of body, self-reliance and courage in sudden emergencies, than riding on horseback. If this habit—coupled with the cultivation of flowers and fruits, so appropriate to the female sex—prevailed among our ladies, we should hear less of spine complaints, and the host of other real and imaginary diseases which rob our ladies of half their charms and most of their usefulness. Many of our societies do now offer premiums for the best riding by ladies; let us hope all of them will adopt the practice.

Some excellent draught horses were exhibited, of which I noticed a span belonging to the Massachusetts Powder Company, which exhibited great power and excellent training, especially in backing heavy loads, which was equal to that of the best trained oxen.

The show of fruits and flowers was very large and fine, the long tables in the hall being quite filled with them. Large numbers and varieties of pears were exhibited, which, though not equal to the magnificent specimens grown in the immediate vicinity of the metropolis, were many of them really fine and of the most approved sorts. The apples were abundant, and better than the pears. A few varieties of grapes were shown, but owing to the unfavorable season, they were not very ripe, nor, except a few hot-house grapes, of the best varieties. Charter Oak and wild grapes are not worth growing, now that we have *good* and *hardy* grapes that will give abundant crops on any good corn soil. My belief is that good grapes may be grown on the sunny slopes of the hills in this town.

Of vegetables there was not a very large display, nor were they of the best quality. I confess to some surprise at this, for, in our Middlesex, farmers think they cannot go into the winter without a good supply of roots to feed out to their cattle with the dry fodder of that season. Roots promote the health of the cattle and are an alternative to grain in feeding or fattening, and it is undoubtedly good husbandry to grow them.

I was much pleased with the exhibition of articles of home manufacture. Shawls, counterpanes, and many other specimens of household industry, wrought with much taste and skill, bore evidence of the housewifery accomplishments of the ladies.

Elegant specimens of boots and shoes, and palm-leaf hats—which are made in this town in great numbers—were also exhibited. After an eloquent address from the Hon. A. H. Bullock, of Worcester, the Society went to dine, and the ceremonies of the day were over.

E. W. BULL.

WORCESTER NORTH.

The annual exhibition of this society was held at Fitchburg, on the 25th of September.

The interest usually felt in the occasion was somewhat abated by the absence of cattle; but the efforts of the members of the association to secure a good representation of other kinds of live stock, and of crops, fruit, and articles of manufacture, were crowned with abundant success.

The ploughing and spading were well performed; and as your delegate witnessed the former of these two operations, performed by horses, he was led to consider whether, on the rather light lands of the north part of Worcester County, where farms and the market are well adapted to the dairy, to fruit, and grain, the use of the horse was not most economical.

The exhibition of the smaller farm animals was very good. The swine had been reared and fed with considerable care, in accordance with a fact noticeable throughout the Commonwealth, that these animals are better bred and better cared for than any other animals on our farms.

The sheep possessed many points to recommend them. Those on exhibition were represented to be a mixture of Cotswold, South Down, Leicester, and native. It would be difficult to say what such a combination as this would produce; but it was somewhat evident that an attempt had been made to produce size at a small expense of feeding, and without due regard for shape. There are but few districts in Massachusetts, capable of feeding during the summer months, the larger breeds of sheep, in such a manner as to develop to the highest degree their flesh and wool. Too much care cannot be taken, therefore, to secure such animals as will preserve their symmetry, with such supply of food as our farms readily afford. A half-fed cow may possibly pay, in proportion to what she consumes; a half-fed ox may drag through his daily toil; but a half-fed sheep seldom does more than reproach his owner for the mistaken economy practiced upon him.

There were many horses on exhibition, which were well worthy of notice. The round, compact, and muscular shape of the Morgan horse, was everywhere visible. That fine specimen of this breed of horses, known as the Green Mountain Morgan, or Hale horse, had evidently left strains of his blood in this region; and for energy and strength of bone and muscle, few families of Morgans have surpassed his own.

The breeding mares were as good a collection of well-shaped and serviceable animals, as can be found in any part of our State—not remarkable for especial care and uniformity in breeding, but coming well up to the standard of the farmer's horse of all work.

In the hall, the collection of fruits, flowers, vegetables, and the productions of manufacturers and mechanics were very attractive. The ingenuity and skill of the mechanics of Fitchburg, and the surrounding country, are too well known to need comment; and the manufacturers there require no praise.

The display of fruits and vegetables, however, was finer than was anticipated. The highest cultivation was shown, in the specimens of pears, apples, grapes, &c., which graced the tables. They indicated the greatest attention to this branch of husbandry, both in the garden and orchard. To good care must have been added a remarkably well-adapted soil, to produce such fruit as was on exhibition. And as this was by far the most interesting part of the show, there can be no doubt that this society may furnish some valuable information to the farmers of the Commonwealth, as to the comparative profits of fruit growing and other cropping, and as to the soils best adapted to this branch of agriculture.

The roots exhibited were very fine, but selected from smaller quantities than should be found in a region adapted to dairy farming. The grain was excellent.

The affairs of the society were represented to your delegate as being in a highly prosperous condition.

George B. Loring.

WORCESTER SOUTH.

A cattle show without any cattle is very much like a play with the part of the principal character left out. And such was the show held at Sturbridge on the 4th of October last.

I arrived on the ground at about eleven o'clock, A. M., and found the common well filled with people—most of the cattle pens empty. A few were filled with fine looking sheep, and some with swine of the best proportion which I have seen at any exhibition. There was also a good display of poultry. Horses and colts were there in considerable numbers, and the committee was performing its duty in examining them. After witnessing the trials of speed, (none of which were very frightful,) I went into the fine brick hall of the society, which was well filled with fruit, vegetables, grain, manufactured and fancy articles, and products of the dairy.

The fruit consisted mostly of apples, which were very fine, and in very great abundance and variety. There were a few good looking pears and peaches.

The vegetables were not in great abundance, but were of good quality.

Some very good samples of wheat and flour were there.

The butter and cheese were in great quantities, and probably were of good quality; but of this I cannot speak from knowledge, as the committee were at their work, and had a guard to keep off all interlopers; and from the distance at which I was permitted to look on, I could not tell whether the quality was good or bad.

At one o'clock, P. M., a good dinner was provided at the Central Hotel, and at two o'clock, instead of an address, a discussion was held at the church for two hours, of four questions, viz.: on the culture of wheat in Massachusetts; on the culture of root crops; the encouragement for fruit culture; and the propriety of bringing cattle to the next show. There was a good attendance, and the discussions were interesting and useful, and would have been much more so, had there been sufficient time for each question.

At four o'clock the discussions closed for the reading of the reports. The day had been cloudy, showing strong signs of rain, and by this time it fell in profusion, dispersing the people to their homes, and greatly interfering with the arrangements which had been made for an evening entertainment at the hall.

The show was as good as could be expected under all of the unfavorable cirumstances attending it.

I am indebted to the president of the society, Doctor Fiske and his good wife, and others, for kind attentions.

E. W. Gardner.

WORCESTER SOUTH-EAST.

Your delegate attended the first fair and exhibition of the Worcester South-east Society, held at Milford, on the 10th and 11th of October. He found the board of managers busily engaged at an early hour in arranging the tables in the spacious town hall, covering them with specimens of all the varieties of agricultural productions as well as a number of objects of manufactures.

The great feature of the exhibition was the display of fruit, consisting of apples and pears, arranged in six hundred dishes, which appeared to be of the finest and most approved kinds. One grower presented fifty varieties of apples. Among the roots, I noticed specimens of sugar beets and the mangold wurzel, 900 and 1,300 bushels to the acre. Of cereals, there were one or two samples of wheat, 31 bushels to the acre, and a remarkable one of California barley, weighing 65 pounds to the bushel, and 40 bushels to the acre.

Little attention is paid to the products of the dairy in that section of the county, and only a few samples of butter and cheese were exhibited.

From the appearance of the country in the vicinity of Milford, covered as it is with boulders and bushes, I should judge it well adapted to sheep-husbandry, which I strongly recommend to the farmers there as well as elsewhere in our State.

The show of swine was numerous and worthy of notice, particularly those from Chester County in Pennsylvania, and Columbia, in New York, which were large and compact, without being coarse.

There were no cattle, for a well known cause. Of horses, there were but a few, and scarcely any worthy of extended notice, although doubtless some were well adapted to farming purposes. A few coops of Chitagong fowls, and one of Bremen geese, with another of turkeys, all well grown, appeared very well.

The ladies presented many specimens of their handiwork; the pictures in worsted, attracted much attention, appearing at a little distance like designs of the pencil.

The principal manufacture of Milford, is boots, which were well made and appeared capable of being "trampled on by all the world," a consummation ardently desired, no doubt, by the manufacturers.

I was much indebted to the Hon. Mr. Mayhew, president of the society, for his hospitable attention, as well as to Mr. Cooke, chairman of the board of managers, and the members generally, for their cordial greeting, and to the ladies of the vinous committee, I desire to render especial thanks—our communication savored somewhat of a *spiritual* character and was very interesting.

The exercises of the second day consisted of a dinner, and an address from Dr. Loring, at which I could not make it convenient to attend.

I am happy to say, that the best order prevailed, and not a single instance of intemperance was noticed.

Charles B. Allen.

HAMPSHIRE.

The mission of your delegate to the late exhibition of the Hampshire County Agricultural Society was accomplished with pleasure to himself and the desire that it might not be without some benefit to those to whom he was sent. Contemplating the duty assigned to him, he examined the latest agricultural statistics of the county in the census, under revision by a committee of the legislature, and compared them with those of former years. Facts were thus ascertained which he deemed of sufficient importance to demand consideration by the farmers of Hampshire and suggestive of inquiries the solution of which might be of practical service. Accordingly these facts were presented, concisely, and as it is believed, with accuracy; but in consequence of the brevity which the occasion necessarily required, the practical inquiries suggested by them could not be pursued. The knowledge of these facts may lead to similar investigations and inquiries with respect to other counties, and they are therefore repeated here.

Hampshire County—the "County of Homes," as its name is said to signify—was formerly, with only one exception, the largest sheep-raising district in the Commonwealth. Comparing the statistics of the county in the latest census with those of former years, your delegate was struck not only with the decline of this branch of agricultural wealth and prosperity, but with the marked changes also in others. In 1837, there were in Hampshire, as we have seen it stated, 43,000 sheep of various breeds. In 1850, this number had been reduced to 33,000. In 1855, to 22,000. In 1860, to 16,000. Thus, in twenty-three years, there has been a diminution of 27,000—or more than sixty per cent. of the number of these most valuable animals. It would be matter of curiosity, if not of benefit, to ascertain from authentic records, were it possible, how much the number of dogs—a class of animals useful, when properly trained and in their proper place, but mainly a non-producing class—had been increased within the same periods of time.

Sheep we regard as among the most valuable and profitable sources of agricultural wealth. A sheep-farming system must be highly advantageous to the land, and, with proper care and attention, would yield a large proportion of profit in the wool and carcase of the animal.

Undoubtedly, the farmers of Hampshire have satisfactory reasons to offer for this marked change in the objects of their attention, and it might be for the advantage of others to know what they are. The fact is potent that the farmers of Hampshire and Berkshire are amongst the largest producers, in the Commonwealth, of wheat, corn, oats, broom-corn, and, we are now obliged to add, of tobacco. And the question suggests itself whether sheep do not yield a manure best adapted to fertilize the soil for these grains and at the smallest expense. Indeed, the whole subject of sheep-raising, whether for advantage to the land or the profit of wool and mutton demands, we think, the attention of all our farmers, and is worthy of careful consideration. We cannot but regret the change so apparent in this county, if it be indicative of circumstances which will in the end seriously affect the agricultural wealth and prosperity of that portion of the Commonwealth.

In 1855, there were in this county 3,500 oxen; whereas, there are now, according to the latest census, only 2,900. Sixteen towns are represented as sharing this diminution; some of them to the extent of more than fifty per cent. In 1855, the number of steers was 3,400, and now it is 9,800,—the increase being very large in every town. In 1855, the number of cows was 14,000; and now it is less than 11,000,—exhibiting a diminution in every town, except one. This remarkable change from products of the dairy to offerings for the shambles—from butter and cheese to beef—suggests the inquiry whether the cause of it is to be found in the evil, which so generally affects agricultural communities elsewhere,—the difficulty of procuring at a reasonable cost, or, indeed, at any cost whatever, competent and reliable help for carrying on the dairy,—or in the relative profitableness of the dairy and of raising and fattening cattle.

Hampshire County is remarkable, according to the statistics of 1855, in another respect,—the entire absence of swine in sixteen of its towns. This deficiency is now supplied, according to the statistics of 1860, which represent the possession of more or less swine in every town, and of 4,200 in the whole county. Yet even this number exhibits a diminution of more than thirty per cent. since the census of 1850.

The inquiry is suggested by these facts whether the statistics of the census of 1855 were correct; or whether any local and temporary cause then existed for this remarkable abandonment of swine, which has now passed away? Or does the relative profitableness of pork and beef and other sources of gain to the farmer afford a more satisfactory solution of the inquiry?

In 1855 there were in the county 41,000 acres of mowing land, yielding annually 38,000 tons of English hay. The present census records 42,000 acres, yielding 40,000 tons. Both these statements exhibit the average crop of English hay as less than a ton to the acre. The census of 1860 shows, furthermore, that, in one town, there has been a diminution of three hundred per cent. in this article, since 1855; and, in another town, a gain of one hundred and fifty per cent.

Of other lands and crops your delegate could not speak, because he could not obtain any authentic record of them at the time.

The point, to which he intended to call the attention of the society, was—the importance of having only accurate and reliable statistics of the agricultural wealth and products of the county made public. And the inquiry he would have suggested is, whether measures might not be adopted by the society itself, for the accomplishment of so desirable an object, before the next census shall be taken. Not only is the reputation of the farmers for intelligence, industry, and thrift concerned, but, as the facts become part of the published statistics of the whole country, they help to form that general authentic information, of which,—if in any respect unfavorable,—commercial agents and eagle-eyed statesmen abroad will avail themselves, for decrying our climate and soil, or interfering, by legislative enactments, or by large importations of produce, with the labor and income of our people.

The exhibition of this society was held on the 11th and 12th days of October, and was highly creditable and successful, and the whole aspect of the society is indicative of vigor and prosperity. It is only just, however, to say, that the character of the exhibition, and the present vigorous and prosperous condition of the society are owing, in a great measure, to the energy and efficiency of the President, and Executive Committee. By their united efforts, the society had been safely carried through a sharp contest, exhibiting at one time, peculiar asperity,—a tract of land embracing sixteen acres, had been purchased, graded and fenced ; and, within about three weeks before the exhibition, a large, well-constructed building had, by almost superhuman efforts, been erected and finished throughout. It was peculiarly gratifying to observe with what a generous spirit these efforts were appreciated by the people, and how strong was the disposition to sustain a policy which had resulted so advantageously to the society ; and if any disaffection yet remains, we cannot doubt that entire unanimity of feeling and action will soon be restored.

The grounds of the society are situated in the south-eastern part of the beautiful village of Amherst, at a distance of less than two miles from the centre, where the exhibitions were formerly held, and are well adapted to their purpose. They afford ample room for large exhibitions of stock; for ploughing, drawing and spading matches ; and for various gymnastic exercises, which have here been introduced with general satisfaction. There is also a perfectly graded and well-proportioned track for such exhibition and trial of horses as is demanded by the spirit of the times. Comfortable and elevated seats are arranged for the occupancy of ladies, who may thus have a complete view of every department of the exhibition on the grounds. The building is capacious,—100 feet in length by 50 feet in width,—containing on the lower floor, a hall suitable for the exhibition of every class of articles which may properly be presented there; and on the upper floor another hall capable of accommodating comfortably a thousand persons.

The programme of the occasion was happily arranged and exactly carried out,—avoiding all confusion and delay. The delivery of the address in the hall was assigned for an early hour in the afternoon of the first day, giving to all who desired, an opportunity to hear it, without discomfort and without additional expense; and to the attraction of a distinguished and eloquent orator, was added the novelty of excellent music, by the club of Old Folks. The hall was filled with earnest listeners, and the appropriate and instructive address by Dr. Loring, of Salem, was received with the highest satisfaction and applause. The music of olden times, performed with artistic skill, fell gratefully and with stirring power upon many ears.

To enumerate and describe the multifarious articles arranged in the hall; the successive exhibitions of stock upon the grounds; the ploughing, drawing and spading matches; the gymnastic exercises; and—the crowning interest of the occasion—the beautiful display of horses, with different trials of their training and speed, and the healthful and graceful contest of equestrianism by ladies and gentlemen; all this is unnecessary, and would extend this report beyond appropriate limits. Suffice it to say, that there was in the hall an exceedingly fine display of the various products of the field, the garden, the orchard and the dairy,—of female industry, taste and skill,—and of various mechanic arts, which were all viewed by crowds of visitors with gratification and benefit. Among the specimens of mechanic art were several of great excellence and deserving special consideration—particularly mowing machines of different patents, and a cylinder plough, which appeared to be well constructed and better adapted for general use than any we have seen.

There is scarcely any thing more important to the farmer, at the present day, than the improvement and better adaptation of agricultural implements, and the introduction of valuable labor-saving machines. These are now multiplied to an almost incalculable extent, and we believe it would be time spent to great advantage, if agricultural societies, either independently or in combination, where they are contiguous, would set apart a day, at an earlier season than the annual exhibition, for a leisurely inspection and trial of such machines and implements as inventors and patentees are endeavoring to bring to public notice and sale. One of the most distinguished farmers of the Commonwealth once said, on being questioned respecting the use of new and improved implements, that he had built several barns for storing the thousand almost useless implements, which he had been tempted to purchase by the assurance, backed by many names, that they were really improvements. Now, if such an examination, trial and comparison of implements and machines, as we have suggested, could be had at different places, it would benefit every farmer in the land; save much vexatious disappointment and expense; and at least, afford opportunity, to all interested, to select satisfactorily such as are best adapted to their wants and their means.

We noticed in the hall, several specimens of seed-grains of different sorts and of great perfection—some of which were raised and contributed by a gentleman who worthily occupies a seat at this Board and is a most efficient member of the Hampshire Society. We regard the offering of premiums for grain, root and grass seeds, as worthy of being adopted by all agricultural societies, and tending to effect a general improvement in the quality as well as quantity of the best farm crops.

The quantity of stock exhibited was, for obvious reasons, unusually small. In quality, however, it was good, and some of a superior character. We noticed a beautiful herd of Ayrshire cattle owned by L. Sweetser, Esq., formerly a member of this Board. Among them was a cow five years old, weighing 860 pounds, that had yielded, in twenty consecutive days, a quantity of milk equal to her own weight. Also a fine pair of grade short-horn oxen, five years old, weighing 3,520 pounds; and several other pairs of admirably well-trained cattle—particularly a fine pair of steers trained by a lad under sixteen years of age. But we must confess to a great disappointment of our expectations of seeing more and finer cattle in this part of the Connecticut Valley. A similar feeling of disappointment attended our inspection of sheep and swine.

The ploughing match was contested by only five competitors, on the first day, ploughing with oxen; and by only seven on the second, using horses. The contest, however, was spirited and the work well done. The general employment of a driver of the team, besides the holder of the plough, seems to us to be unnecessary with any thing like a well-trained team; and equally so, the frequent urging of the team, which indicates an anxiety to complete the work quickly, rather than to do it thoroughly.

One of the most pleasing features of this occasion was the admirable spirit manifested, in the free and joyous association of the men of literature and science from the academic hall with the hardy cultivators of the soil and industrious laborers in the mechanic arts; all engaged, with apparently equal zeal and interest, in promoting the special objects of the day. Nor do we know of any thing which affords better promise for the advancement of the great interests of the State, than the closer union between science and labor which is here and elsewhere felt to be essential to the common weal, and the ampler provision which is here and elsewhere made for higher attainments in the knowledge and application of those sciences chiefly pertaining to agriculture and the mechanic arts.

The recollection of Amherst and its beautiful scenery—so garnished as it was by the hand of creative wisdom and benignity—its noble institutions of learning, offering the best possible advantages for acquiring knowledge and forming character, sharpening the intellectual and strengthening the physical powers—the general intelligence and moral worth, the comfortableness and happiness of the people that crowded the agricultural hall and grounds; and especially the attentions and generous hospitality which your delegate received, will ever remain among the pleasant memories of his life.

CHARLES C. SEWALL.

HIGHLAND.

Agreeably to appointment by the Board, I was present at the second show of the Highland Society, at Middlefield, Hampshire County, September 13 and 14.

Owing to a violent easterly storm, the day preceding the exhibition, but a small collection of stock was expected, but to my surprise over three hundred head were on the grounds.

The farmers of this vicinity devote themselves principally to the raising of neat cattle for beef purposes, and they have spared neither pains nor expense in procuring animals of the most approved breeds, for the improvement of their stock.

The show of oxen and steers was the best I have ever seen at a county show, not for numbers or perfection of training, but for size and early maturity; almost every yoke, especially of steers, was quite remarkable. A pair of grade Durhams, three years of age, sired by "Roan Duke," were estimated to weigh 4,000 pounds; several other yoke, the same age, would weigh from 3,200 to 3,600 pounds; two pairs of three years old Devons were marvels for beauty, weighing about 2,800 pounds each; the yearling and two years old grade Durhams were unusually large.

The collection of bulls though small was very superior.

Devon bull "Winchester," (590) eight years of age, attracted a great deal of attention, and was a very fine specimen of this popular breed. A bull calf by the above, out of "Minna," (906) was a most promising animal.

Hereford bull "Prometheus," three years old, from Remington's herd, New York, was a large and valuable creature.

I was much pleased with an eight months Durham bull calf, by "Marmal Duke," out of a Thoroughbred cow from Mr. Lathrop's herd, of South Hadley.

I was particularly interested in the Durham bull "Roan Duke," six years old, by "Grand Duke," the latter imported by Mr. Thorne, of New York, at an expense of one thousand guineas. "Roan Duke" is one of only three bull calves ever sired by "Grand Duke," in this country; he is a splendid specimen of the "short-horn" family, and has already been of great service in improving the size, and hastening the maturity of the cattle raised in this vicinity; although he was not on the grounds, a notice of him should accompany this report. I think him a most invaluable animal for this locality, where he seems to be highly appreciated.

The show of cows and heifers was not large, and this being a beef raising district, more attention appears to have been paid to the size of cows, than to beauty or milking points; there were, however, a few on the ground, principally grade Durhams, that possessed the requisite qualities for large milkers.

Of sheep there were fifty-eight entries, mostly of the fine-woolled varieties. There can be no question but that this mountain portion of our State is eminently adapted to the raising of sheep; there is not so much attention paid to it now as formerly, but I was glad to see by the anxiety exhibited by farmers present, to purchase those on the grounds, that sheep husbandry is receiving renewed attention. The supply of the fine-wool breeds was not equal to the demand.

There were but few entries of swine; not many are raised in this locality, corn being a very uncertain crop on these frosty hills.

Within the building, the show of apples was very good; of pears there were but few good specimens; of garden vegetables a fair supply.

Among the dairy products I noticed some superior samples of butter. But little cheese was exhibited.

In the ladies' department I was pleased to see that nearly all the articles presented for exhibition were of a useful nature, calculated for substantial service. Quantities of homemade, or rag-carpets; also homemade flannels, thick and well woven, particularly struck my attention.

The second day was pleasant, and the attendance large. There were entered 115 horses and colts, nearly all of them well calculated for every-day use.

Eight stallions, mostly of the Black Hawk family, showed their paces on the rather uneven and heavy track; these were followed by matched, and family horses, and horses for all-work, and lastly by the mares and colts.

At one o'clock, a procession was formed, which marched to the Congregational Meeting-house, which was soon filled. A most instructive and interesting address, "On the Horse," was delivered by Professor Clark, of Amherst. This was listened to by the large audience with the closest attention ; the subject being illustrated by diagrams, added much to its value, as all could understand the *points* as explained by the speaker.

At the conclusion of the address, the premiums in silver plate, were distributed among the successful competitors.

During the evening of the first day, a very pleasant reunion of the members of the society was held in the hall, on the fair grounds, at which the ladies were present. Short, but pithy speeches were made by several gentlemen, the general tendency of which went to prove, that there is no life like that of the farmer, for real independence and consequent enjoyment. The speeches being interspersed with good music, the evening was pleasantly and profitably passed.

The festivities of this exhibition were appropriately closed by a ball, on the evening of the second day, which was very generally attended by the lads and lasses of the surrounding district.

In closing, I would remark that a very noticeable and gratifying feature in this exhibition, is the fact that this society is almost entirely composed of working farmers. No wealthy, fancy farmers (so called), had their blooded stock here to compete with, and discourage the workers from contending for the premiums, as is undeniably the case in some places.

This society has grown up amidst some discouragements, but owing to the perseverance and determination of a very few persons, it has now become firmly established. There has been some effort made to get up a rival society, whose grounds would be located within a few miles of those at Middlefield. I was glad to hear that many who had heretofore favored a separate organization, are coming forward and joining this.

If we have not already too many societies in our State, I am sure that we have enough, and they are so scattered that all can be reasonably accommodated. I trust that the idea of another society in this vicinity, will be abandoned. Two weak societies could not help the cause of agriculture, as can one strong one. In a sparsely populated district like this, farmers must be willing to come from a distance, and I feel assured that if those within the society's limits will come forward and help the cause, that the Highland Society will become one of the soundest and most useful institutions of the kind in the State; an institution established by the working farmers, supported by them, and for their benefit.

I believe that the object of the State in lending its aid for the encouragement and improvement of agriculture, is nowhere better carried out than by this association.

HENRY H. PETERS.

HAMPDEN EAST.

The day of the annual exhibition by the Hampden East Agricultural Society was fine, and well adapted to the purposes of the occasion.

Arriving at Palmer early in the forenoon, my first impression was, that I had made a mistake in regard to the appointed day, so little indication did I see of such a public interest and such a general gathering as is usually met with at the cattle shows which I have heretofore attended. My first inquiries at the railroad station, as to the location of the exhibition, were answered doubtfully, the respondent saying that he *believed* there was some kind of a show behind the hotel, in which direction I turned my course, and in due time reached "Hampden Park," where I had the good fortune to meet the delegate from the Hampden East Society to this Board, from whom I received every attention which the occasion required. The park presented nothing attractive, the panic in regard to the cattle disease having prevented the exhibition of neat stock, and in company of Col. Knox, I proceeded to the hall in which were exhibited the various articles usually shown in such places, and I most cheerfully give the society credit for a very neat, though not very large exhibition. The specimens from the vegetable productions of the farm were of a very superior character. Superb and healthy looking potatoes, fine squashes, beautiful wheat and rye, and in this connection I would also mention bread and butter delicious to the eye, were of as high a quality as I have ever seen at such places. The exhibition of fruit was very attractive, and manifested good care in the selection of varieties, and diligent culture which was shown in the quality of the specimens. I have often noticed that when the cultivation of fruit is first introduced to any locality, the tendency is to select fancy varieties, rather than those of well established reputation. But the cultivators in Hampden East appear to have acted more wisely, and to have avoided the evil of multiplying the kinds at the expense of profit. I think, indeed, in reference both to apples and pears, I saw fewer varieties which would not at once command a remunerating price in the market than is usual, even in the oldest fruit districts.

My time being very limited, I did not attend the dinner, nor hear the address, and must pass them over without comment. If I were to speak a word of advice to the managers of the society, it would be in reference to an effort to increase the interest in the public exhibitions of the society. I think I never saw so few people collected at any exhibition of the kind, as at Palmer, although I was informed by several persons, that the number would be much increased to witness a horse trot in the afternoon, which was not, however, under the auspices of the society.

Without in any way touching the propriety of such exhibitions, the thought occurred to me, that if a horse race must come off, it would be better to hold it in the morning, in order to draw out the people at a time when a crowd could be made more profitable to the society.

Upon the whole, however, the exhibition, although not extensive, was calculated to call forth a spirit of emulation, and an effort for improvement which must redound to the benefit of the farmers in its neighborhood.

JOHN C. BARTLETT.

FRANKLIN.

The eleventh annual Franklin show and fair of the Franklin County Agricultural Society was held at Greenfield on the 27th of September. My appointment by the State Board was to attend the exhibition of the Essex Society, but at the request of Hon. Charles G. Davis, of Plymouth, I made an exchange, and attended at Greenfield. Previous to entering upon my duties there, I learnt that its second day's exhibition was to be dispensed with, and that there were to be no cattle, no address, and no dinner. I began to wonder what they would have! On arriving upon the grounds I found that the society's untiring secretary had so arranged that the exhibition was successful, interesting, and profitable. A large crowd of people was present to witness it.

The show upon the grounds of the society was confined to the exhibition of sheep, swine, and fowls. The display of all these was said to be far superior to those of any former year.

I consider the best feature of all was the sheep, of which there were thirty entries, and one hundred and fifty on exhibition. Thomas J. Field, of Northfield, had over fifty, of three different grades. D. O. Fisk, of Shelburne, entered five lots, and several others made entries. The secretary of the society exhibited fifteen most superior lambs, which were a cross of the Oxford Downs and Irish Smuts. Their appearance shows this to be a most judicious cross. Mr. Grennell also exhibited two pure bred Oxford Down bucks, from the imported stock of Richard S. Fay, of Lynn. This breed promises to become a most valuable and profitable addition to our sheep husbandry. They possess fine bone and symmetry, light offal, early maturity, great aptitude to fatten, and yield a heavy fleece of fair quality of wool.

Mr. Richards Bradley, of Brattleborough, added to the exhibition by presenting, at the request of the officers of the society, his pure bred Cotswolds, recently selected and brought out from England by Sanford Howard, Esq., of Boston. As a breed they stand high, both in England and in our own country. Those of Mr. Bradley are very fine specimens of the breed.

Of swine, there were fifteen entries, comprising about sixty animals, and a very good collection. Mr. Grennell's Chester County, Pa., boars were very conspicuous, and seemed to be the sultans of the harem. The best premiums were won by the stock which was a cross with this on other breeds.

Mr. J. A. Clark, of Greenfield, exhibited pure bred Suffolks, which have descended from our best importations of that noted breed.

There was a good exhibition of poultry, made up out of nineteen entries. Mr. J. A. Clark had wild geese, fancy pigeons, and very fine game fowls. Bronse turkeys, and many other varieties of fowls were on exhibition. The enterprising farmers in this county have done much to introduce the best breeds of cattle, horses, sheep, swine and fowls, and for their liberal outlay and enterprise, they are reaping their reward.

The exhibition in the hall was creditable. Fruit was displayed in abundance, consisting of peaches, grapes, pears, and apples. Of the two latter, most superior specimens. There was a fair display of vegetables. Whole number of entries of fruits and vegetables three hundred and seventy. Entries in the hall of other articles comprise agricultural implements, cutlery, domestic manufactures, fancy articles, &c. In the ladies' department, among the substantials, I noticed twenty rag-carpets, twelve pieces of frocking, and numbers of bed-quilts, counterpanes, &c.

The horses were shown in Main Street, and drew a great crowd. There were a large number of fine and well-bred animals exhibited, particularly the two and three-year-old colts, which show great improvement in the breed of horses in this county. The horses on exhibition could not appear to so good advantage as they would, had they had suitable grounds for their performance. I would recommend to this, and to all other agricultural societies in this Commonwealth that have not grounds, to procure such, and erect suitable buildings, and I predict such societies will prosper.

I cannot close this report better than to copy from the Greenfield Gazette, which says: "Great credit is due to J. S. Grennell, Esq., the secretary of the society, for the success which attended the show. Mr. Grennell has spared no pains or expense to add interest to it by the presence of a large and fine collection of sheep. It will tend, we hope, to stimulate our farmers to engage in sheep raising to a greater extent than they now do; a branch of stock raising to which many farms in this county are well adapted."

PAOLI LATHROP.

BERKSHIRE.

The cattle show and fair and celebration of the fiftieth anniversary of the Berkshire Agricultural Society were held on the 3d, 4th, and 5th days of October, in Pittsfield, on the grounds of the society, and were attended by your delegate the first two days, agreeably to appointment by the Board.

The show grounds and buildings of the society seem so well adapted to the purposes for which they are designed, as hardly to admit of improvement. The grounds are quite extensive and nearly level, except a moderate elevation, on one side, which affords a distinct view of the whole, and on which stand the buildings, consisting of an exhibition hall, a dining hall, treasurer's office, &c., all under the same roof, and a one-story block, comprising several apartments, which are rented to victuallers, as a source of revenue to the society. The plain below affords ample space for the exhibition of stock, stables for horses, a half-mile course for the exhibition of horses, ploughing match, and pasturage for stock that may arrive from a distance before the day of the fair.

On the first day were exhibited the cattle, sheep, swine, and poultry, the products of the dairy, the fruits and vegetables, the implements of husbandry, the products of mechanical skill and industry, and the handiwork of the ladies.

The cattle, three hundred and forty-four in number, bore favorable testimony to the fertility of the soil upon which they were bred, as well as to the sound judgment and correct taste of their owners, in breeding, matching and training. Of some fifty pairs of working oxen on the ground, all in fine condition, and well matched, there were twenty pairs at least whose average weight would not fall short of thirty-six hundred pounds.

The cows and heifers numbered one hundred and one. Fourteen milch cows and fifteen breeding cows were entered for premiums, which would form a herd not easy to be surpassed. Probably no other society, in the State, has ever exhibited as large a number of cows of equal excellence. These cows were large and handsome, mostly grade Durham, Devon, and Ayrshire.

The fat cattle were good, but not numerous.

There were exhibited sixteen bulls, including bull calves, thirteen of which were entered for premiums. Several Thoroughbred Short-horns, and one Devon, were large and beautiful. They were all, with one exception, noble animals, and attracted much notice.

Two herds of cattle were upon the ground which would grace any farm in the State. The heifers and steers were large and handsome, and showed more of imported blood than their elders.

Two classes of sheep were exhibited, fine and coarse-wool sheep, mostly of Merino and Cotswold blood. Several Cotswold bucks, ewes, and lambs attracted, as they deserved, great attention. One of the bucks weighed two hundred and sixty-four pounds. The sheep, one hundred and seventy-eight in number, and swine ninety-four in number, I have never seen equalled at any show. There was the usual display of poultry of all kinds, which was very fine.

There was the best display of butter and cheese I have ever seen at any show. There were thirty-seven entries of butter, weighing from twenty to fifty pounds each, and fifty cheeses, the average weight of which was upwards of forty pounds.

There were seventy-seven entries of bread, embracing many kinds, which, arranged as it was, with several fine specimens of honey and maple sugar, constituted quite an attractive part of the show.

The specimens of fruits and flowers were not numerous. The flowers were fine for the season. The apples and pears were chiefly of choice varieties, usually large and fair.

The vegetables were abundant, and of mammoth size ; such as the soil of Berkshire is wont to produce. The specimens of grain and grass seeds were of the first quality.

The ladies of the society manifested a laudable pride in exhibiting their splendid specimens of butter, cheese, bread and other domestic manufactures. The ornamental, as well as the more useful articles, wrought by them with the needle and otherwise, were in great numbers, and of great beauty and excellence. Among the articles contributed to the show by the ladies were several specimens of currant and blackberry wine.

On the second day, the last half of which was quite rainy, the show of horses and the spading match took place. The number of horses was large, embracing many fine animals. The breeding mares, fourteen in number, with colts by their sides, were by far the most pleasing as well as the most excellent feature of the horse show. It will be conceded that no county in the State can compete successfully with Berkshire in rearing cattle, horses, sheep and swine.

The spading match, which I failed to witness, on account of the rain and mud, was said to have been contested with great energy. The ground, spaded by each competitor, was sixty-four square feet of tough sward land, and the work was well done by three of the men in less than ten minutes.

Here ended the exercises of the second day, save and except the very disagreeable one of returning to our lodgings through a deluge of rain and mud. The exhibition, as far as it was my fortune to witness it, was one of great excellence. There was nothing to condemn, but much, very much, to approve and commend. It was said by those who knew, that this was the best show they ever had. It should be stated here, that the recent law of the State, requiring the whole of certain crops, entered for premium, to be weighed, is quite unpopular in Berkshire, as its tendency is to check competition in such crops.

The ploughing match, the trotting for prizes, and the semi-centennial celebration came off on the third day, and, as I am credibly informed, to the entire satisfaction of all interested. I am informed by a friend that the ploughing match was contested with energy by twenty teams, ten of horses and ten of oxen ; the work was done in the best manner.

I would not fail here to acknowledge the cordial welcome and generous hospitality extended to me by the officers and other gentlemen of the society.

O. C. Felton.

HOUSATONIC.

Owing to the illness of Professor Clark of the Board of Agriculture, who had been assigned as visitor on the part of the Board, to the annual exhibition of the Housatonic Society, a meagre report prepared in haste, and at a late day, is all that can be furnished.

The exhibition of 1860 was the nineteenth in the series of annual exhibitions held under the auspices of the society. The society after the experiment of a two days' fair the year previous, has gone back to its former practice of holding it during three days. It has altogether outgrown the two days' system, and to endeavor to compress its exercises within that limit, would be like striving to put a growing boy into the boots he wore a dozen years ago.

The display of stock on the grounds on the first day, especially the neat stock, was remarkably fine. It is a general remark among the farmers of South Berkshire, how superior in quality all kinds of live stock have become within the last ten years. Stock which took first premiums during the infancy of the society, would hardly be looked at seriously now-a-days with a view to the bestowal of premiums.

This is owing very much to the private enterprise of many wealthy amateur stock-growers who have come among us, but also very much to the influence of the agricultural society, which by the opportunities it presents for mutual comparisons of the various kinds and grades of stock raised by our people, and the emulation it incites, cannot but make itself felt and appreciated in the year-by-year improvement which is manifested.

As to the ladies' department, we can say that we never saw finer specimens of dairy productions. The butter and cheese was fully up to the standard which Berkshire County has ever maintained. In the way of needle-work of all kinds, we are sorry that we see so little exhibited, and that little of so unsubstantial a character. We do not see as much of homemade flannels, rag-carpeting, mittens, and hose, bed-spreads and other useful products of female handicraft as we could wish. The days of old-fashioned looms and spinning-wheels have indeed pretty much gone by. We are almost sorry for it,—but the same enterprise which has banished the implements of yesterday has introduced the new ones of to-day. We could wish, where either one or the other must be dispensed with, that sewing machines might be generally preferred by our young ladies, over piano-fortes. We have not advanced beyond that stage in human affairs, when home industry must look about itself in vain for something useful to do. New improvements only create new wants and requirements.

Of the ploughing match on the second day, and the trials of speed and draught of single and pairs of carriage and work horses, we need only say, it was fully up to the average of such exhibitions throughout the State.

The third day was devoted principally to trials of speed of horses, and attracted a large concourse of people. The weather throughout was favorable. The receipts into the treasury exceeded by several hundreds of dollars, the receipts of any previous year, and the society is every year reducing the debt which it incurred by purchase of its lands and erection of its fences and buildings.

The society is in a highly prosperous condition, and nothing but some unforeseen occurrence can retard its constant growth and increasing means of usefulness.

Samuel H. Bushnell.

HOOSAC VALLEY.

By appointment of the Board I attended the exhibition of the Hoosac Valley Agricultural Society, held at North Adams, September 18th and 19th.

This was the first exhibition held by this society under their act of incorporation, and as such may be considered as a satisfactory commencement. The attendance was good from the towns connected with the society, and a very commendable interest manifested in all departments of the show. The grounds on which they held their exhibition, and which it is understood it is contemplated to secure to the society, are well adapted to the purpose. It is a beautiful plat of bottom land, on the banks of the Hoosac, about three-fourths of a mile from the village of North Adams, and is admirably adapted to the purpose.

A good half-mile track for the trial of horses has been constructed on the premises, and the other accommodations, although put up as a temporary arrangement, were well adapted to the occasion.

There was a respectable number of neat cattle entered for exhibition, many of which would have attracted attention in any exhibition in the State. There was the usual show of sheep and swine, but nothing worthy of especial notice in these departments.

The products of the dairy were worthy of notice. In the article of cheese, the samples were of a very superior quality, fully sustaining the reputation of that part of the State. In butter the show was decidedly good, and the exhibition of grain and vegetables of all kinds was highly creditable.

The products of the orchard were very respectable. One individual presented one hundred and fifty varieties of apples, many of which were of a superior quality, and many specimens on exhibition indicated that that locality is particularly well adapted to some varieties of this fruit.

The show of horses was worthy of particular notice. A large number of animals were entered, many of which were of a superior order, and showed good training.

On the whole we would say that we were highly gratified with the general arrangements of the exhibition, and are satisfied that although its organization as an incorporated society met with some opposition, it was nevertheless a very judicious movement, and called for by the interests of agriculture in that vicinity. The society is in the hands of efficient men, who take a deep interest in the subject, and no doubt can be entertained that the society will take a respectable position among the agricultural organizations of the State.

Freeman Walker.

NORFOLK.

The undersigned, appointed as delegate of the Massachusetts Board of Agriculture to attend the annual exhibition and show of the Norfolk County Agricultural Society, has the honor to report:

That the show was held on the grounds and in the hall of the society, on the day fixed by law and the following day. The occasion seemed to excite the usual degree of interest among the people of the county. The attendance on the second day was large.

The show of articles of domestic manufacture was creditable to the ladies of Norfolk County. The exhibition of fruits was large, especially of pears. The collection of articles of heavy manufacture was small. The variety and character of vegetables, and samples of farm products, was excellent. The pervading fear of the cattle disease prevented the general exhibition of cattle; but Mr. Austin, of West Roxbury, presented his importation of Kerry cattle, which was especially interesting. Mr. E. R. Andrews exhibited an Ayrshire bull; and there were a number of the "Jamestown" stock, descended from a cow imported by R. B. Forbes, Esq., in the United States ship Jamestown, on her return from her charitable mission to Ireland. These cattle are regarded with much favor.

The collection of horses was good, and the exhibition of them upon the track was one of the most attractive features of the occasion. Among other animals, Mr. Shaw's Thoroughbred stallion, Balrownie, was exhibited and led around the track by his groom. His perfect development and unblemished beauty made him for the time the "bright particular star" of the hour.

The spading match was vigorously contested, and a ploughing match with horses was well sustained.

The dinner was served in the hall of the society; after which the annual address was delivered, at the table, by Hon. George S. Hillard. It was a finely written discourse on the reasons why a Massachusetts farmer should be contented with his lot, and is worthy of publication as an exhibition of some of the finer aspects of agricultural life. Other brief addresses were made by president Felton, your delegate, and others.

The grounds of the society are not spacious enough for its purposes, and the separation of the hall from the field enclosing the track is unfortunate. It is desirable, of course, that all the operations of the annual exhibitions and shows of our societies should be carried on within one enclosure, in such a manner as to be at all times under the immediate inspection and guidance of the officers.

As the delegate of this Board, I have to report that the Norfolk Society is vigorous and intelligent in its pursuit of agricultural improvement, and that its annual exhibition of 1860 was held in compliance with the letter and spirit of the laws of the Commonwealth.

GEORGE MARSTON.

PLYMOUTH.

The Plymouth County Agricultural Society is one of the most wealthy, flourishing, and oldest societies in the State, having been incorporated in the year 1819. They have extensive grounds, at Bridgewater; a large and well arranged hall, a half-mile track, and all the necessary fixtures, which make it one of the most desirable agricultural exhibition grounds in the State. The fair was held on the 4th and 5th days of October.

I was very cordially welcomed. To the president, Hon. Charles G. Davis, I am indebted for much kindness, attention and hospitality. In no year has the labor of the husbandman been more richly rewarded, or the general prosperity more advanced. The season has been a fruitful one. Again has been fulfilled the divine promise of seed-time and harvest.

The ploughing match being first in the arrangements, I did not witness, not arriving in season, but was told that it was spiritedly contested and satisfactorily performed. There were no cattle exhibited. Owing to the disease which prevailed in the early part of the season, causing great panic and alarm, and justly so, it was very properly thought best to exclude cattle from the fairs in the middle and eastern portions of the State. A *cattle show* without cattle is like a summer without the light and heat of the sun to invigorate, to cheer, and to gladden. A very important part of the exhibition is wanting—and although there is much to attract and to interest aside from this, still the absence of this important feature creates a void for which there is no substitute. To make up for this deficiency in part, there was a large, most beautiful and attractive display of fine horses. The exhibition on the course was of great interest and very exciting. There was a good display of choice poultry. The exhibition of swine was not what it should have been, or what I expected to have seen in this county.

Only a few ordinary sheep were exhibited, for which there is a good reason, there being at this time only 3,215 in the county—a county which, from my limited knowledge of it, is better adapted to sheep husbandry than for any other purpose. If the farmers of this county could be induced to engage in this pleasant and comparatively less laborious business than almost any thing done on a farm, I am confident from observation and an experience of more than thirty years, that they would find it to pay well—better than any other business.

The display of fruits and vegetables was uncommonly good. Apples, pears and grapes were in great abundance and perfection. The variety and quality, as well as size of many of the specimens, cannot well be surpassed. In the dairy department the exhibition was of an excellent character, showing progress in this important branch of agriculture. Particularly I would mention butter exhibited by the president of the society, made from cows kept up during the year. Never have I seen any grass-made butter that was better.

The address of Dr. George B. Loring on the, to all farmers, deeply interesting subject, "the different breeds of cattle," was every way worthy of this distinguished gentleman, and was listened to with marked interest throughout, by an attentive audience.

The large amount of agricultural implements and mechanical productions falling under my notice, was in the highest degree creditable to the county—the skill and ingenuity displayed evincing progress in this important department of industry.

The ladies' department was well sustained. There was a fine display of beautiful and elaborate specimens of their handiwork, which was much admired, and constituted a highly interesting feature of the occasion. To keep up and increase the interest in this department, should be a prominent object of every society, for in proportion as the ladies are interested in these annual festivals, will be our success.

The exhibition closed with an excellent dinner, speeches, and singing. Nothing transpired to mar the festivities of the occasion. All was harmony and good feeling, every department being well sustained, evincing an onward progress, and furnishing abundant proof of the increasing interest in the improvement of the soil and the cause of agriculture.

SAMUEL H. BUSHNELL.

BARNSTABLE.

The Barnstable County Agricultural Fair was held on Tuesday and Wednesday, the 9th and 10th days of October, governed by the rules and regulations established according to chapter 66 of the General Statutes of Massachusetts.

Success has become a habit with the officers of the Barnstable Society in the discharge of their duties. The exhibition in all the *necessary* crops of the farm and in the abundance of fruits displayed, was a fit summing up of the evidence of the progress which has been made in agriculture and its kindred branches. The number of premiums awarded was 288. For the geographical boundaries and the character of the soil, (as the water lines and the surface soil are somewhat changeable,) the writer begs leave to refer to the latest topographical surveys and to the work of Professor Hitchcock, "Soils of the Cape." On the Cape the sea was a more apparent fact to the eye of your delegate than the land. The wind seems to blow from every quarter. Tuesday, 9th, was mainly devoted to the exhibition of neat stock and other stock of the farm, farm implements, farm crops, and household industry. The ploughing match was attended in the afternoon, and the hearing of an address, (subject, "Farming with a Reason,") was attended in the evening. Wednesday was full of promise and realization to the treasury of the society, and of satisfaction to the great numbers who visited the exhibition. Never on the Cape has more sound sense been exhibited in one day, in providing good cheer for the body and instruction for the mind. From sunrise to sunset the exhibition hall was crowded with visitors. The annual address by George S. Hillard, full of reasons "why a farmer should be contented with his lot," made all the farmers who heard him very contented—and much more so those who heard him who were not farmers. The seats in the meeting-house were filled during the delivery of the address, and so were the five hundred seats at the dinner table, set next in order in the day's proceedings. The dinner was in all respects creditable to the society, and the speeches characteristic of those who made them. At six and a half o'clock a bountiful collation was spread before the members and guests of the society, at the mansion of S. B. Phinney, where speeches followed as at the dinner, full of satisfaction to all who were present. The day's work of the officers of the society was, at eight o'clock, P. M., begun to be wound up in a *ball*, and finished by the aid of some five hundred members and friends of the society, at a reasonably early hour next morning.

Dairy Products.—The exhibition of dairy products, especially of butter, showed that there was good stock kept here, and *as well fed* as need be. The product of the cross of the Durham and the Alderney upon the native stock, tells in right direction.

Working Oxen, Horses, Swine.—The farmers here, as elsewhere, seem to have become accustomed to the expense of keeping a stronger force of working cattle and horses than they actually need. Light weight horses are most commonly used. The attention already given to the breeding of horses promises well. The sea air must exercise a favorable influence upon the swine family—the specimens exhibited were remarkable in all " their points," or rather symetrically rounded lines. They were model porkers.

Root Crops.—The potato yields abundantly hereabouts. The mangold and carrot also thrive with easy culture in this soil and atmosphere. Among the varieties of potato cultivated, the Jackson Whites, (for early) New York Peach Blow, Nova Scotia, Prince Albert, Davis Seedling, and State of Maine, grow vigorously, improving in excellence. Sixty-three hundred and sixty pounds of potatoes from one pound, (three years planting,) were entered for premium. Seventy varieties of garden vegetables were exhibited—perfect in their kind, and showing a nearer appreciation of the true value of this crop than usually prevails.

Fruit.—There were ten exhibitors of peaches of choice varieties. One branch from a tree was shown, bearing, in clusters, within fifteen inches space, *thirty-five* ripened peaches. Uncultured pears were shown from a tree which had blossomed *eight* times during the season. The exhibition of pears, Flemish Beauty and other prized varieties—of apples of many of the best named varieties—quinces, large, smooth, plump and sound—cranberries, (from vines planted in May last,) solid and fair—and other fruits shown, not only proves that the soil of Barnstable is capable of bearing abundant fruit crops, but that, owing to atmospherical influences, the fruit is fairer, bears a brighter color, and ripens earlier, than in many other sections of the State.

Domestic Manufactures.—The premiums paid in this class, upon articles made at the fireside, numbered one hundred and eight. The character of the articles exhibited, told of the skill, taste, and industry of their exhibitors.

Grains.—The success recently had in growing wheat in Barnstable County (the premium crop was thirty-six bushels to the acre) is encouraging.

Bread and Gingerbread.—The bread shown, made from wheat, rye, corn, wheat and rye, corn and rye, wheat meslin, rye meslin, and corn meslin, was deserving of the premiums awarded and thanks besides. A premium of three dollars for the best card of gingerbread, and two dollars and one dollar for the next and the next best, excited the ambition of a score or more competitors. The premiums were earned many times over. *The* four loaves of bread in the exhibition, and the maker, sixteen years old and under, will be remembered by all who noticed the success of the undertaking.

The farmers of the Cape give evidence in their exhibition of having formed a habit of yearly adding to their own experience a knowledge of what is being done elsewhere in advancing the cause of agriculture—thus giving scope to their ideas and energies, and stimulating them to bear in due proportion, the work which they have to do. Why should not *facts*, drawn from the science of agriculture, be everywhere received as guides to action, as well as the facts developed in the sciences involved in other branches of employment? Sound judgment will not deny or refuse to consider such facts simply because they are new to us. It is not for lack of facts that we stumble along the road to progress, but because so many farmers have chosen to be " a law unto themselves" rather than to consult the laws of nature.

This practice has led to the general confusion of ideas which prevails. The farmers, therefore, and *not* well-digested books, are responsible for the false doctrines believed concerning scientific agriculture.

Let every farmer handle the subject as Isaac Walton did the frog which he impaled on his hook—"as though he loved it"—and a better understanding and more harmonious results will follow.

GEORGE M. ATWATER.

NANTUCKET.

Having been delegated to attend the fifth annual exhibition of the Nantucket Agricultural Society, held on the 11th and 12th of October last, I respectfully submit the following:—

Leaving Boston on the morning of the 10th, I arrived at Nantucket at half-past two, P. M. Through the kindness of Capt. E. W. Gardner I enjoyed a ride over a considerable portion of the central part of the island, during the afternoon. A person from the "Continent," as the people here term the main land, is peculiarly, and I may say painfully impressed upon his first visit to the island. Nantucket has been famous the world over for her enterprise in the whale fisheries. She has been the means of bringing the world out of darkness into light in more senses than one, and it is through no fault of hers that that light has paled before various substitutes. The harvest was limited, and necessity, that prolific mother of invention, has furnished us with superior and cheaper illuminating substances in coal gas and kerosene, while the end is not yet.

A few years ago Nantucket, in the height of her prosperity, fitted out annually about twenty whaling ships. This year she fits out but five or six. This having been the main interest and business of the island, the result is to be anticipated. A few hulks of whale ships lay at her wharves, seemingly for no other end than to see which shall go to decay the sooner. Storehouses are tenantless and empty. The enterprise of the inhabitants has departed. Grass literally grows in her streets.

After the decadence of the whaling business, the California fever broke out, and its influence upon the island was very marked. A large number of persons, mainly young men of enterprise, embarked for the gold region, in the hope of finding an outlet for their ambitious aspirations. One effect of this movement is still to be seen on every hand, but especially in public assemblies, where four out of every five persons are females.

Under these circumstances the question forces itself upon our notice, what is to be the future of Nantucket? Is she to go to decay with the decline of her whaling interest, or is there enterprise enough among the inhabitants, and opportunities for its exercise, to render it still a place of thrift and growth? One or two manufacturing establishments have been in operation for a time, but the wealthy men on the island, of whom there are many, seem to be afraid of investing their capital in any thing that might be supposed to assist in building up and sustaining an active and thriving people. With the loss of their faith in the success of whaling seems to have departed also their faith in the success of Nantucket, and they seem unwilling to invest money in any enterprise on the island, which they condemn in advance as promising nothing but failure. As a consequence, the capital of Nantucket seeks employment away from home.

There are to my mind two prominent sources of prosperity open to Nantucket in the future. The first, and perhaps the more important, is that of which mention has just been made, the employment of capital at home rather than abroad. There are very many sources of investment which would operate in bringing money to the island and prosperity to the homes of the people. Of these it is not my object to speak. The other is the encouragement of agriculture. Nantucket is by no means a favored region in an agricultural aspect. A great portion of the island is covered with a loam extremely sandy. Indeed, in other parts of the State it would hardly be called soil at all. This land would not pay for cultivation were it not for the fact that it may be worked with extreme ease, and also that kelp and sea-weed are to be had in unlimited quantities for the bare labor of their manipulation. Through this source of fertilizing materials a large variety of crops may be grown with success and profit, some with better results than others. Cranberries, above most things, should be tried and encouraged. A few experiments seem to indicate that this important crop would succeed. Strawberries, whortleberries, and blackberries are eminently worthy of trial. Of this latter berry, I was told that upwards of three hundred bushels were imported the past season. The best use, I believe, to which the area of sandy soil after all may be applied, is to the growing of wood. Some five hundred acres have already been planted with pines, and for the four or five years that they have been growing they are certainly exceedingly promising. There is no natural wood to be found upon any part of the island, although Capt. E. W. Gardner, in excavating for peat, struck some quite large stumps of trees, indicating that at some former period there must have been at least a few forest trees of goodly size. This entire absence of wood makes it necessary to go abroad for that material for all purposes to which it is applied. There is neither wood for fences nor stone for walls.

A smaller portion of the island is covered with a soil of a different character, being composed in part of clay, and here, it seems to me, is to be found the source of future agricultural prosperity. That it is capable of the highest and most successful cultivation, a glance at the products exhibited in the hall affords abundant evidence. Field beets, turnips, and other roots, as fine as can be raised in the State, adorned the tables. Onions of the finest quality, were on exhibition, which were taken from a field yielding at the rate of eight hundred bushels to the acre. Good crops of corn and grain were represented by fine specimens, and the same quality of land upon which they were grown has produced the past season three, and even as high as four, estimated, tons of hay to the acre as a first crop. In the department of fruits there were quinces, unexcelled, perhaps, in the world, certainly in my limited experience. Pears, of large size and fine quality, though most of them wore a russet coat. The Flemish Beauty, in particular, was completely covered, in many cases, with a fine russet. The same tendency was observed in apples, of which I saw very good specimens, particularly the Rhode Island Greening. The advance made since attention has been directed to pear culture, may be appreciated when it is stated that ten or eleven years ago there were but three pear trees on the island. Unusually fine specimens of Isabella grapes, and good clusters of Diana, were plenty, to say nothing of beautiful, large clusters of Black Hamburg, and other varieties of European grapes, exhibited by the president of the society and others. There were eighty-two different contributors of fruits, being a gain since their first exhibition, in 1856, of one hundred and thirty per cent.

Among the noticeable things in the hall was a bottle of water from the spring which supplied the mother of Benjamin Franklin, during a period anterior to his birth. The people of Nantucket, it may not be generally known, claim a share in the paternity of this remarkable philosopher.

The show of stock, which took place on the 11th, on grounds owned by the society, indicated that the farmers had not been asleep upon that subject. The introduction of an Ayrshire bull, two or three years ago, has been the means of perpetuating some of his fine qualities in the persons of a number of promising heifers. Of milch cows the show was only ordinary, the best cows, as I was informed, not being upon the ground. The Galloway, or hornless breed, were well represented, and seemed to be valued about as highly as any stock of more recent introduction, they having been brought upon the island in 1825. Fine sheep, swine and poultry also gave evidence that no department of stock was neglected. At two o'clock, P. M., six teams, three of horses and three of oxen, competed in a ploughing match, but upon soil of such a character that there was nothing to call into action any special virtue either of team or ploughman.

On the 12th, the day was occupied at the grounds, by the exhibition of horses. Nantucket is not so far from the "continent," that the horse fever has not had an influence. It has manifested itself in a general improvement in the horses, and created a desire to see something "fast." There was, however, no set trot, though a plenty of extemporaneous and "scrub" efforts.

There was no public dinner of the society, or address. The more particularly social part of the festival was enjoyed in the exhibition hall during the evenings of both days.

I was much indebted to the various officers of the society for attentions, and for items of information.

JABEZ FISHER.

MARTHA'S VINEYARD.

According to my appointment as the delegate from the State Board of Agriculture, I attended the cattle show and fair of the Martha's Vineyard Agricultural Society at West Tisbury, on the 16th and 17th days of October. During the limited time I remained there, I improved such opportunities as were in my power to examine the natural and agricultural resources of the Island, and of comparing its present and past condition; such observations being in my judgment of more general benefit and interest than a bare description of the festival which brings us together on such occasions.

The Island of Martha's Vineyard (originally called Martin's Vineyard), was discovered in 1602 by Bartholomew Gosnold, and settled in 1642 by Thomas Mayhew, a London merchant of high standing. It lies about five or six miles from the main land, and is divided into three townships, Edgartown, Tisbury and Chilmark; it is of irregular shape, about twenty-one miles long, and from five to ten miles wide.

The geological features of the Island are very interesting. On the western and northern parts the surface is broken, frequently rising to elevations one hundred and fifty feet above the level of the ocean, while between these are beautiful valleys covered with a thick growth of capital pasture grasses, or producing good crops, with manure and skilful cultivation. These pastures have a clay formation which becomes deeply covered with diluvium towards the interior. Immense quantities of granite, graywacke and sienite boulders lie scattered on the surface and on the beach, and occasionally in excavations; pebbles of quartz, porphery and feldspar are found, all of which must have been borne from the main land. To the east and south, stretches a vast plain—occasionally broken by small valleys,—of diluvium or drift, a light and rather unpromising soil, covered largely with "the little chincapin" or shrub oaks and other stunted shrubbery. Mr. Emerson in his valuable work on the Trees and Shrubs of Massachusetts, says of this oak: "The bitterness of the bark shows that it abounds in tannin, and it might doubtless be advantageously used by the tanner, as the small branches of most of the oaks are in Europe. Where this little oak constitutes the principal growth, it might easily be made to perform an important service. If the seeds of the pitch pine, the red cedar, the larch, or some of the valuable oaks were placed at the right season, an inch or less beneath the surface of the soil, they would spring up under its shade and be protected by it from sun and wind until they were large enough to need no further protection, after which it might be grubbed up or left to die gradually in the shade."

I should think that any part of these plains, cut off and burnt over to destroy the bushes, would yield a handsome crop of rye every two or three years, perhaps annually; if this could be done, the ashes and subsequent rotting of the roots would very much enrich the land. Very handsome rye from a crop of forty-three bushels to the acre was exhibited, showing what can be done.

Other portions of the Island where the soil is sandy but free from stones, might, I am sure, in the want of farm yard manure, be made to pay good crops by the use of guano and green crops ploughed under.

There are upon the Island in various places, large beds of muck, peat, vegetable deposit, salt mud, and swamp mud of various qualities, all more or less valuable. Large quantities of kelp, rock-weed, and sea-weed are thrown upon the beach at some seasons, which furnish materials for compost. On the north side of the Island, fish are taken for the same purpose.

There is considerable wood yet upon the Island; that it was formerly heavily wooded is attested not only by tradition, but by remains of submarine forests at Holmes' Hole, and also on the north shore of the western extremity of the Island.

The land produces good grass, and with manure and cultivation, cereals and roots may be made profitable.

The population is 4,410, or about 130 less than in 1850. The extent of territory is about 55,000 acres, of which not over 45,000 are available for any use. Of these about 1,400 acres are annually tilled, about 1,800 are upland mowing, yielding a little over a ton of hay to the acre. About 763 acres of corn are planted, averaging 27 bushels to the acre for Chilmark, and Tisbury, and only 11 for Edgartown. 197 acres are sown to rye, averaging 7 bushels; 168 acres of oats, averaging 18 bushels; and 102 acres of potatoes, averaging 163 bushels for

Tisbury, 120 for Edgartown, and 59 for Chilmark. There were in 1855 but 14 acres of cranberries upon this island so well calculated for their culture.

In comparing the agricultural resources and productions of the Island with former years, we find that their 1,820 head of neat stock from 1845 to 1860 had increased in number, four. Horses increased from 304 to 400 ; swine decreased from 710 to 367. Sheep went from 11,677 to 9,276 ; and wool decreased about 20 per cent., which in my opinion is a most unfortunate mistake. Indian corn has increased 25 per cent. ; rye, 16 per cent. ; oats, 11 per cent. Of turnips they get 300 bushels to the acre ; and of carrots, 350 bushels.

The products of the dairy show a material and praiseworthy increase. In 1845 25,446 pounds of butter and cheese were made, valued at 4,360 dollars. In 1855 there were 32,369 pounds, valued at 7,600 dollars, showing not only a large increase of quantity, but a marked improvement in the quality as shown by the price of butter—25 cents per pound for what was in 1845 19 cents per pound ; and 12½ cents for cheese instead of 9 cents. This shows an advance in good farming, especially as in that time the number of cows had not increased in any thing like the same proportion.

In the village of West Tisbury, the society has enclosed about two and a half acres of land, on which is a two-story building 70 feet by 50, containing their exhibition hall below, and above, committee rooms and a dining-hall, all ample and convenient.

Both days devoted to the exhibition were bright and pleasant, and the people began to gather on Tuesday morning with their products for "the show," and by noon they were arranged. The neat stock first claimed my attention, and I must say they were very much better than I had expected to see, and would have made a creditable appearance in almost any exhibition in the State. There were seven entries of working oxen ; they were not tried, but they seemed "handy," and were well matched. There were six entries of fat cattle, some of them uncommonly good ; one yoke of oxen would weigh over 4,000 pounds ; these were all fatted on grass ; indeed the pastures in Chilmark and the northern side of Tisbury are of a very superior quality, and cattle get very fat there betwixt May and

October. Six entries of steers, some very good; a half dozen milch cows and three bulls completed the list. These animals all looked well; they were mostly what would be called native stock, with an occasional dash of other blood from the main land. I should think the Ayrshires would be a desirable introduction on the island.

Sheep have been raised on this Island for more than two hundred years. In 1653, Capt. Humphrey Atherton obtained leave from the provincial government to keep sheep on the Island of Martin's Vineyard. I expected to see large numbers of this profitable animal, so many years cultivated in this locality so peculiarly adapted to them, and I was very much disappointed that more were not shown. Seven entries of twenty-five sheep were all that appeared on the ground, and this in a county having 21,000 acres of pasturing, having 9,200 sheep, producing 19,800 pounds of wool, valued at $7,359,—a county eminently adapted for raising sheep, and where growing sheep for wool and for market, ought to be a principal object. I almost feared that they had not recovered from that raid of the British in the revolutionary war, when Lord Gray with his troops drove off 10,000 sheep and 2,000 cattle.

Those who have sheep or other stock, ought on such occasions to be at some trouble to have them on the ground. It is an injustice to the active men of the society, to the community, and to themselves, not to contribute; and I understood that many of the best farmers of the Island either staid away entirely, or came to it empty-handed. It seems to me that they ought to keep a great many more sheep and of a better quality. In 1855, (and it won't differ very much now,) they had 1,350 Merino sheep, which yielded only about two pounds eleven ounces to the fleece, and 7,781 common or native sheep, shearing two pounds two ounces each, the whole averaging thirty-six cents per pound. These sheep, when killed, dress only about forty-eight to sixty pounds; with such pastures and facilities for keeping sheep, it seems to me they should breed more positively for either meat or wool. The first would be gained by introducing the hardy Down sheep, to give size and perfection of form, and early maturity; to attain the latter, careful adherence to correct breeding of the Merino would accomplish every thing they could wish. The farmers of the

Vineyard allow their sheep to run in the pastures all winter, occasionally feeding them at their barns, but not enclosing them ; they say the sheep are fond of the kelp which is thrown upon the beach.

It does seem to me that there is more need of improvement, and more profit to be realized from sheep than any other production of Martha's Vineyard. No pure-bred sheep were exhibited—some natives, with a dash of Merino, and a grade Cotswold ram. There were some eight entries of swine, very good, including a pair of " Earl of Sefton and Berkshire " pigs, imported at large expense, by Charles B. Allen, Esq. Arriving on the day of the fair, after a long passage from Liverpool, they looked a little hard ; but will, no doubt, greatly improve the stock of the county, which needs it. Poultry there was none, except a coop of ducks. In the hall I was disappointed at the very meagre show of domestic manufactures. I had supposed the Vineyard ladies would display their handiwork more extensively.

There was some very superior fruit displayed, of Island growth. There was a very nice show of bread, butter and cheese, preserves and pickles ; fine specimens of vegetables and grains. Some very handsome specimens of wheat ; and I see no reason why they should not raise good crops of spring wheat. I was again disappointed in another crop, which should be a staple on the Island : of cranberries, there were but three entries, all good fruit, too. They ought to be largely grown ; and yet in 1855, there were but fourteen acres on the Island.

The second day opened as brightly as the first, and the people came early to see the horses and ploughing match, which last was not, only one team appearing.

There were about twenty entries of horses—some very good roadsters and family horses. A handsome four-year-old stallion, and some very fine colts attracted much attention. They have a class of horses which they call " Gay Headers," tough, hardy little creatures, about twelve hands high, bred among the Indians on the " Gay Head " reservation, never seeing any shelter but the lee side of a barn or rock, from the beginning to the end of the year.

The exhibition being closed, the members of the society dined together in the hall. On account of a change of time in running the New Bedford boat, I could not attend it. Both days passed pleasantly, and in all that large, but orderly assembly, I saw no instance of intoxication or unbecoming behavior.

From what I saw and heard, I should think the Vineyard farmers generally, did not pay sufficient attention to the accumulation and preparation of that indispensable basis of farming—manure. I must think that it would pay to enclose and feed, under warm and comfortable sheds, their cattle and sheep, rather than to allow them to run at large, dropping their dung about the fields, to waste.

By littering their barnyards with straw, sea-weed, or swamp-grass, and hauling in a few loads of peat, muck, or swamp-mud, they would save all the manure, the liquid, the most valuable, as well as the solid, and be able largely to increase their crops.

I think, too, if they should feed to their fat cattle, their milch cows and sheep, a little cotton-seed meal, which they can easily get from Providence, they would find their account in the largely increased value of the manure, as well as in the flesh, milk and wool of their animals. Perhaps if the Vineyarders had less other material wealth, and were obliged to depend entirely on their farms for support, they would farm more closely; if the money on hand and at interest, on the Island, were equally divided among the entire population, each man, woman and child would receive twenty dollars more than the population of Franklin County, on a like division of the money in that county; and twelve dollars more than those of Hampshire County under similar circumstances; and twenty more than those of Berkshire.

While some of those whom I met were most intelligent and progressive farmers, they complained that most of their class pursued the path their fathers trod, distrustful of science, and slow to venture into any new fields of experiment.

As the delegate of the State Board I was cordially received, and treated with the greatest kindness and courtesy. For opportunities to see the Island and for information and civilities, I am under obligation to Charles B. Allen, Esq., Dr. Peirce, the acting president, and to R. L. Pease, Esq., the learned and accomplished Clerk of the Courts at Edgartown.

JAMES S. GRENNELL.

APPENDIX.

RETURNS OF AGRICULTURAL SOCIETIES FOR 1860.

FINANCES.

SOCIETIES.	Amount received from the Commonwealth.	Income of the permanent fund.	New members and donations.	All other sources.	Receipts for the year.	Premiums offered.	Premiums and gratuities paid.	Current expenses — not incl'ding premiums and gratuities — for the year.	Disbursements for the year.	Indebtedness.	Value of real estate.	Value of personal property.	Permanent Fund.
Massachusetts, . .	$600 00	$2,326 68	-	$458 33	$3.385 04	$225 00	$200 00	$2,304 87	$2,794 87	-	-	$37,266 87	$37,266 87
Essex, ...	600 00	587 93	$114 00	436 75	1,738 73	1,246 00	72 25	890 29	1,638 87	-	$6,000 00	1.900 00	8.396 66
Middlesex, . . .	600 00	116 00	62 00	185 76	963 76	660 00	476 27	419 34	895 61	-	2,500 00	2,585 00	4,500 00
Middlesex South, .	600 00	24 60	{ 164 23 { 17 00	665 80	1,307 40	927 50	403 49	300 00	{ 175 80 { 907 29	$3,350 00	7,000 00	1.600 00	5,976 00
Middlesex North, .	600 00	-	201 00	3,063 94	3,867 94	798 00	531 12	980 88	4,430 56	2,300 00	6,606 94	453 00	6,590 94
Worcester, . . .	600 00	400 00	4,625 00	897 76	6,522 76	846 50	-	552 42	2,378 60	5,500 00	18,000 00	500 00	18,500 00
Worcester West, .	600 00	178 57	39 00	177 00	994 57	662 00	290 00	216 94	506 94	-	-	3,980 17	3,980 17
Worcester North, .	600 00	233 32	61 75	202 70	1,000 77	794 25	411 64	274 37	742 31	-	-	4 540 89	4,540 89
Worcester South, .	533 83	167 59	66 00	60 00	860 33	593 00	357 25	212 37	569 62	-	2,300 00	827 40	3,127 40
Worcester South E.,	431 27	-	2,200 00	529 15	3,283 42	781 00	189 95	611 26	801 21	105 50	-	146 37	2.371 71
Hampshire, Franklin and Hampden,	600 00	240 00	151 00	820 73	1.814 73	704 25	548 75	896 48	1,876 98	716 75	4,450 00	-	1,000 00
Hampshire, . . .	600 00	701 17	233 00	115 75	1,649 92	858 00	417 25	324 93	2,153 50	848 48	4,472 93	1,841 26	4,472 93
Highland, ...	460 85	34 02	200 00	276 91	971 78	535 25	337 75	170 25	735 93	100 00	2,000 00	911 47	2,811 47
Hampden, ...	600 00	-	9 00	13,950 99	14,560 00	4,814 99	4,280 87	6,891 18	14,156 48	9,400 00	32,153 81	1,000 00	23,753 81

Hampden East,	305 00	63 00	-	51 00	419 00	516 22	-	135 70	135 70	260 00	-	1,800 00	1.800 00
Franklin,	600 00	57 00	50 50	97 50	{ 160 07 { 965 07	585 00	394 00	283 18	677 18	-	2,000 00	1,300 00	3,300 00
Berkshire,	600 00	400 00	154 00	1 558 04	2,712 04	1,455 00	1,188 00	1,167 70	3,930 00	1,250 00	12,000 00	500 00	12,000 00
Housatonic,	600 00	640 00	80 00	1,733 54	3,053 54	956 00	6 51	2,125 28	2,775 28	4,100 00	8,000 00	150 00	10,716 66
Hoosac Valley,	-	-	2,006 00	247 00	2,253 00	422 00	331 50	216 95	551 45	-	-	-	2,006 00
Norfolk,	600 00	-	250 00	1,490 00	2,340 00	1,932 00	413 50	1,260 84	2,704 31	4,800 00	10,414 00	-	5,614 00
Bristol,	600 00	174 00	731 00	1,757 66	3,262 66	1,212 25	910 95	1 224 02	2,134 97	3,000 00	7,500 00	1,659 00	6.000 00
Plymouth,	600 00	571 13	197 00	1,577 63	2,945 76	1,710 50	707 07	1,109 00	3,193 22	2,889 65	17,500 00	1,000 00	18,500 00
Barnstable,	600 00	42 20	90 00	1,134 64	1,866 84	740 00	433 18	1,105 28	1,538 46	-	5,000 00	730 00	5,730 00
Nantucket,	200 00	378 85	47 75	333 04	959 60	440 00	295 73	524 43	958 16	550 00	1,928 53	880 00	2,028 53
Martha's Vineyard,	-	411 52	{ 198 00 { 127 00	1,065 81	1,802 33	564 00	-	572 00	1,800 81	2,000 00	3,175 00	2,033 33	3,208 33
Totals,	$13,196 95	$7,747 54	$12,322 23	$32,866 46	$65,609 03	$24,978 71	$13,323 03	$24,875 98	$55,389 17	$41,370 38	$153,001 21	$67,604 76	$197,212 20

PERMANENT FUND—HOW INVESTED.

Massachusetts.—In bank stocks, Shattuck legacy, policies in Mass. Life Office.

Essex.—In bank stocks, notes, railroad bonds.

Middlesex.—In real estate, mortgages, bank and railroad stock and notes.

Middlesex South.—In lands and building, $7,000; pens, fixtures, &c., $1,000; notes, $600.

Middlesex North.—In real estate.

Worcester.—In real estate.

Worcester West.—In mortgages, notes and cattle pens.

Worcester North.—In bank stock, notes, cattle pens, fixtures, &c.

Worcester South.—In agricultural hall, cattle pens, store house, fixtures, &c.

Worcester South East.—In loan to town of Milford, $1,801.71; loans on endorsed notes, $570.

Hampshire, Franklin and Hampden.—In building, &c.

Hampshire.—In real estate, notes and appurtenances.

Highland.—In real estate, hall, office, &c.; mortgage, pen, stalls, &c., &c.

Hampden.—In land, buildings, &c.

Hampden East.—In notes, fixtures, and two shares in Palmer Park Association.

Franklin.—In real estate, secured notes and mortgages.

Berkshire.—In real estate.

Housatonic.—In real estate and notes.

Hoosac Valley.—In North Adams Savings Bank.

Norfolk.—In real estate belonging to and occupied by the society.

Bristol.—In notes, farm buildings, improvements, &c.

Plymouth.—In real estate, buildings, cattle pen, appurtenances, &c.

Barnstable.—In notes bearing interest, land, buildings, cattle, pens, &c.

Nantucket.—In real estate and endorsed notes.

Martha's Vineyard.—In land, agricultural hall, secured notes, fence ond other fixtures.

ANALYSIS OF PREMIUMS AND GRATUITIES AWARDED.

FOR FARMS, FARM IMPROVEMENTS, MANURES, &c.

SOCIETIES.	For management of farms.	For draining.	For subsoiling.	For ploughing at the Exhibition.	For reclaiming swamp lands.	For experiments with manures.	For spading.	For hedges and ornamental trees.	For reclaiming old pastures.	For orchards of all kinds.	For cranberries.	For other farm improvem'nts, naming them.	Total am't offered for farm improvem'nts.	Total amount awarded for farm improvements.	Total amount actually paid for farm improvements.
Massachusetts,	–	–	–	–	–	–	–	–	–	–	–	–	$225 00	–	–
Essex,	–	$15 00	–	$51 00	$15 00	–	–	–	$25 00	–	$15 00	–	295 00	$121 00	$154 00
Middlesex,	–	–	–	36 00	–	$60 00	–	–	10 00	–	–	–	106 00	36 00	36 00
Middlesex South,	–	–	–	38 00	10 00	–	–	–	–	$23 00	–	$16 00*	217 00	87 00	30 00
Middlesex North,	–	–	–	22 00	–	–	–	–	–	–	–	–	–	–	–
Worcester,	–	–	–	28 00	–	–	–	–	–	–	–	–	217 00	–	–
Worcester West,	–	–	–	19 00	–	–	–	–	–	–	–	–	106 00	19 00	21 00†
Worcester North,	–	–	–	12 00	–	3 00	$15 00	–	–	10 00	–	–	89 00	40 00	36 50
Worcester South,	–	–	–	30 00	–	–	–	–	–	–	1 00	–	126 00	31 00	31 00
Worcester South East,	–	–	–	16 00	–	–	–	–	–	–	14 00	–	34 00	30 00	30 00
Hampshire, Franklin & Hampden,	–	–	–	–	–	–	–	–	–	–	–	–	106 00‡	–	–
Hampshire,	$50 00	–	–	16 00	–	–	5 00	$5 00	–	15 00	–	–	213 00	96 00	65 50
Highland,	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Hampden,	–	–	–	–	5 00	–	–	–	–	4 00	–	–	200 00	9 00	9 00
Hampden East,	–	–	–	–	–	–	–	10 00	–	5 00	2 00	–	145 00	17 00	–
Franklin,	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Berkshire,	–	–	–	48 00	10 00	–	10 00	–	–	18 00	–	–	86 00	–	86 00
Housatonic,	–	–	–	40 00	30 00	45 00	–	–	–	18 00	–	–	75 00	30 00	30 00
Hoosac Valley,	–	–	–	–	–	–	–	–	–	3 00	–	–	5 00§	–	–
Norfolk,	–	–	–	72 00	–	–	14 00	–	15 00	–	–	–	640 00	281 00	99 00
Bristol,	–	–	–	61 00	–	–	7 00	–	–	37 00	–	–	297 00	105 00	105 00
Plymouth,	–	–	–	36 00	30 00	–	6 88	–	–	8 00	–	–	393 00	80 88	80 88
Barnstable,	–	–	–	15 00	–	10 00	–	–	10 00	8 00	5 00	–	99 00	48 00	17 00
Nantucket,	–	–	–	9 00	–	–	–	–	–	–	–	–	32 00	9 00	9 00
Martha's Vineyard,	–	–	–	4 00	–	–	–	–	–	–	7 00	7 00	73 00	18 00	–
Totals,	$50 00	$15 00	–	$553 00	$100 00	$118 00	$62 88	$15 00	$60 00	$149 00	$44 00	$23 00	$3.759 00	$1,057 88	$839 88

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* Seedling grapes, $6; experiments in raising and using corn fodder, $5; experiments in fattening swine, $5.
† Including $5 for premium awarded for ploughing at the exhibition of 1859.
‡ Including $90 offered for experiments with manures, payable in 1852.
§ This society has offered premiums for experiments with manures, payable in 1852, amounting to $60.
‖ Garden culture, fruits, shrubs, &c.

FOR FARM STOCK.

SOCIETIES.	For Bulls.	For Milch Cows.	For Heifers.	For Calves.	For Working Oxen.	For Steers.	For Fat Cattle.	For Horses.	For Sheep.	For Swine.	For Poultry.	All other Stock.	Total amount offered for Live Stock.	Total am't awarded for Live Stock.	Total am't paid out for Live Stock.
Massachusetts,	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Essex,	–	–	–	–	–	–	–	$124 00	$15 00	$21 00	$18 50	–	$185 00	$178 50	$301 50
Middlesex,	–	–	–	–	–	–	–	91 00	–	7 00	20 00	–	165 00	118 00	118 00
Middlesex South,	–	–	–	–	–	–	–	128 00	–	47 00	14 50	–	217 00	189 50	158 62
Middlesex North,	$23 00	$28 00	$27 00	–	$38 00	$23 00	$23 00	42 00	14 00	32 00	14 00	$14 00	383 00	282 00	282 00
Worcester,	–	–	–	–	–	–	–	312 00	19 00	19 00	12 00	–	413 00	362 00	–
Worcester West,	–	–	–	–	–	–	–	93 50	14 00	36 00	10 00	–	184 00	153 50	115 50
Worcester North,	–	–	–	–	–	–	–	90 75	18 50	16 00	11 75	50	213 00	137 50	114 50
Worcester South,	–	–	–	–	–	–	–	123 50	16 00	33 00	5 50	–	198 00	178 00	178 00
Worcester South East,	–	–	–	–	–	–	–	91 00	–	24 00	15 00	–	167 00	133 00	45 00
Hampshire, Franklin & Hampden,	54 00	25 00	34 00	$5 00	83 00	14 00	33 00	168 00	16 00	18 00	–	91 50	538 00	541 50	442 00
Hampshire,	32 00	–	17 00	14 00	10 00	16 00	9 00	152 00	10 00	12 00	9 00	–	493 00	281 00	183 50
Highland,	38 50	18 00	18 00	4 75	24 00	23 75	12 00	114 00	20 50	6 00	–	23 00	372 50	302 50	302 50
Hampden,	*	–	–	–	–	–	–	3,988 75	–	–	–	–	4,080 00	–	3,988 75
Hampden East,	–	–	–	–	–	–	–	55 00	16 00	21 00	6 00	–	135 50	98 00	–
Franklin,	–	–	–	–	–	–	–	80 00	71 00	35 00	10 00	–	192 50	207 00	196 00
Berkshire,	35 00	75 00	40 00	12 00	60 00	30 00	16 00	321 00	86 00	32 00	22 00	10 00	847 00	–	730 00
Housatonic,	36 00	32 00	12 00	6 00	40 00	30 00	11 00	90 00	59 00	14 00	7 00	44 00	407 00	381 00	381 00
Hoosac Valley,	11 00	12 00	9 00	3 00	19 00	10 00	4 00	116 00	17 00	3 00	10 00	–	249 00	214 00	210 00
Norfolk,	–	–	–	–	–	–	–	226 00	–	26 00	29 00	–	569 00	281 00	268 00
Bristol,	48 00	32 00	13 00	8 00	61 00	28 00	46 00	107 00	14 00	18 00	28 00	–	389 00	403 00	403 00
Plymouth,	–	–	–	–	–	–	–	186 00	43 00	45 00	15 00	–	529 00	289 00	373 50
Barnstable,	36 00	14 00	15 00	11 00	36 00	15 00	56 00	31 00	13 00	26 00	18 00	–	389 00	271 00	182 00
Nantucket,	8 00	34 00	–	–	12 00	–	–	51 00	8 00	10 00	9 00	–	142 00	132 50	132 50
Martha's Vineyard,	11 00	5 00	3 00	–	10 00	5 00	11 00	22 00	13 00	10 00	2 25	–	177 00	92 25	–
Totals,	$332 50	$305 00	$188 00	$63 75	$393 00	$194 75	$221 00	$6,806 50	$483 00	$511 00	$286 50	$183 00	$12,131 50	$5,225 75	$9,114 87

* Exhibition not held according to law.

ANALYSIS OF PREMIUMS AND GRATUITIES AWARDED.—CONTINUED.

FOR FARM PRODUCTS.

SOCIETIES.	Indian Corn.	Wheat.	Rye.	Barley.	Oats.	Beans.	Grass Crops.	Grass Seeds.	Potatoes.	Carrots.	Beets.	Parsnips.	English Turnips.	Ruta-Bagas.	Onions.	Other Root Crops.
Massachusetts,	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Essex,	$10 00	$17 00	$8 00	$8 00	–	–	$8 00	–	–	–	–	–	–	–	–	–
Middlesex,	5 00	5 00	–	3 00	–	–	25 00*	–	–	–	–	–	–	–	–	–
Middlesex South,	–	8 00	–	–	–	–	–	–	$29 00*	–	–	–	–	–	–	–
Middlesex North	–	13 00	15 00	–	–	–	–	–	–	–	–	–	$24 00*	–	–	–
Worcester,	2 00	4 50	–	–	$1 00	–	–	–	1 00	–	$1 00	–	–	$1 00	–	$2 00
Worcester West,	–	–	–	–	8 00	–	–	–	–	–	–	–	–	–	–	–
Worcester North,	16 75	9 00	–	5 00	–	$3 50	–	$3 00	3 75	$3 00	6 75	–	75	7 00	$0 75	1 25
Worcester South,	6 00	–	–	–	–	–	–	–	50	3 00	–	–	–	–	–	2 00
Worcester South East,	6 00	10 00	6 00	2 00	4 00	–	–	–	–	10 00	–	–	–	–	–	–
Hampshire, Franklin & Hampden,	–	14 00	–	–	–	–	–	–	–	4 00	–	–	–	–	–	–
Hampshire,	1 00	1 50	1 00	1 00	1 00	50	2 00	1 00	1 00	–	–	–	1 00	1 00	–	1 00
Highland,	–	3 00	–	–	3 00	2 00†	–	–	–	6 00	–	–	–	5 00	–	–
Hampden,	5 00	16 00	2 00	–	–	–	–	–	4 00	6 00	6 00	–	–	2 00	–	4 00
Hampden East,	8 00	1 50	1 75	–	75	2 50	–	–	1 50	25	1 50	$0 50	–	–	6 25	–
Franklin,	–	5 00	–	–	–	–	–	–	6 00	3 00	–	–	–	–	4 00‡	–
Berkshire,	–	–	–	–	–	–	–	3 00	–	–	–	28 50*	6 00*a*	6 00*b*	21 00*c*	–
Housatonic,	39 00	18 00	14 00	9 00	18 00	–	–	12 00	10 00	14 00	–	7 00	4 00	–	3 00	–
Hoosac Valley,	–	5 00	6 00	5 00	5 00	2 00*d*	2 00*e*	–	3 00	2 00	6 00*	–	–	–	–	–
Norfolk,	14 00	6 00	–	–	4 00	–	–	–	–	–	–	–	–	–	–	25 00
Bristol,	39 00	–	–	4 00	9 00	–	–	–	–	32 25*f*	–	–	–	8 00	–	8 00
Plymouth,	–	5 00	8 00	8 00	13 00	4 00	–	–	–	–	8 00	–	–	12 00	38 00*	15 00*g*
Barnstable,	14 00	6 00	–	–	8 00	–	–	–	–	–	–	–	5 00	–	–	–
Nantucket.	26 00	5 00	–	10 00	4 00	–	5 00	–	5 00	–	–	–	–	–	–	–
Martha's Vineyard,	–	–	–	–	–	–	–	9 83*	–	–	–	–	–	–	–	–
Totals,	$182 75	$152 50	$61 75	$55 00	$77 75	$14 50	$42 00	$28 83	$64 75	$83 50	$29 25	$36 00	$30 75	$42 00	$65 00	$58 25

* Vegetables. † Buckwheat. ‡ Broomcorn. *a* Sowed Corn. *b* Cabbages.
c Gardens. *d* Crop of Messlings. *e* Buckwheat. *f* Specimens at Fair. *g* Squashes and Cabbages.

FARM PRODUCTS—CONTINUED.

SOCIETIES.	Total amount offered for Grain & Root-Crops.	Total am't awarded for Grain & Root-Crops.	Total am't paid out for Grain & Root-Crops.	Broomcorn Brush.	Fruits.	Flowers.	Any other cultivated Crops.	Milk.	Butter.	Cheese.	Honey.	Wheat Bread.	Rye and Indian Bread.	Corn Bread.	Total am't paid out under the head of Farm Products.
Massachusetts,	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Essex,	$89 00	$51 00	$48 00	-	$126 50	$35 00	$55 25	-	$40 00	$18 00	$12 50	-	$6 00	-	$376 25
Middlesex,	53 00	38 00	38 00	-	153 25	35 00	-	-	20 00	-	-	$11 00	3 00	-	261 25
Middlesex South,	109 00	8 00	8 00	-	57 50	4 00	-	-	14 00	-	9 50	6 50	5 00	$2 00	112 75
Middlesex North,	96 00	28 00	28 00	-	78 50	-	-	-	14 00	-	-	12 00	6 00	-	190 50
Worcester,	30 50	12 50	-	-	-	-	5 50	-	15 00	27 00	-	-	3 00	-	-
Worcester West,	73 00	8 00	-	-	27 00	18 00	6 00	-	12 50	60 00	-	10 00	10 00	-	115 75
Worcester North,	99 25	60 50	53 50	-	86 50	6 75	25 15	-	17 50	4 50	3 00	2 50	2 00	-	200 90
Worcester South,	26 00	11 50	11 50	-	27 00	3 00	7 00	-	10 00	10 00	8 75	4 50	3 00	-	85 00
Worcester South-East,	90 00	38 00	19 00	-	51 00	6 00	34 50	-	10 00	6 00	-	3 50	-	-	73 25
Hampshire, Franklin and Hampden,	88 00	18 00	-	$12 00	46 00	6 00	-	-	10 00	5 00	2 00	3 00	2 00	1 50	*
Hampshire,	24 00	24 00	16 75	1 00	21 00	3 50	15 00	-	6 00	5 00	3 00	3 00	3 00	-	53 25
Highland,	54 00	19 00	19 00	6 00†	10 00	2 25	1 00	$3 50‡	6 50	6 50	1 50	50	50	50	57 75
Hampden,	131 00	39 00	39 00	-	88 75	18 00	20 75	-	29 00	30 00	15 00	2 00	1 50	-	203 60
Hampden East,	17 00	12 75	-	-	24 50	5 00	16 00	-	6 00	5 00	3 00	50	1 50	1 50	-
Franklin,	80 00	18 00	18 00	4 00	26 00	3 75	5 00	-	15 50	9 00	6 50	-	7 25	-	91 00
Berkshire,	310 00	-	64 50	-	31 00	9 00	-	-	21 00	24 00	6 00	6 00	3 00	3 00	167 50
Housatonic,	150 00	139 00	139 00	3 00‡	35 00	9 00	20 00	-	15 00	15 00	2 00	1 50	1 50	1 50	107 00
Hoosic Valley,	64 50	35 00	*	-	7 00	6 00	-	-	5 00	6 00	1 50	1 50	1 00	-	74 00
Norfolk,	135 00	49 00	33 00	-	42 00	28 00	-	-	26 00	5 00	-	15 00	5 00	-	85 00
Bristol,	228 00	102 25	102 25	-	62 00	2 75	-	-	20 00	15 00	12 00	7 00	7 20	-	228 20
Plymouth,	205 00	69 00	69 00	-	79 50	-	-	-	18 00	18 00	-	3 75	5 75	-	194 00
Barnstable,	108 00	33 00	40 00	-	24 43	11 25	27 50	-	3 00	6 00	-	6 00	6 00	6 00	91 00
Nantucket,	159 00	68 38	68 33	-	26 25	5 25	-	-	11 00	-	3 00	3 35	-	-	412 90
Martha's Vineyard,	123 00	-	-	-	13 37	5 00	-	-	6 00	-	-	75	75	-	§
Totals,	$2,566 25	$882 88	$824 83	$29 00	$1,187 05	$223 50	$288 65	$3 50	$331 00	$221 00	$89 25	$107 75	$71 05	$16 00	$3,193 94

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* But a small portion of premiums awarded under this head called for as yet. † Garden vegetables. ‡ Maple sugar.

§ Not having received the State Bounty for the present year, and in consequence of a late season, and the impracticability of making full returns for all crops entered, in time for this report, the Trustees of the society have ordered that no premiums should be paid until after January 1st, 1861. Therefore the necessary omission of items under the head of "*Farm Products*," and "*Awards actually Paid.*"

MISCELLANEOUS.

SOCIETIES.	Amount awarded for Agricultural Implements.	Amount offered for raising forest trees.	Amount awarded and paid out for the same.	Am't offered for experiments on manures in accordance with the requirements of the board, payable in '62.	Am't awarded for all other objects strictly agricultural not specified before.	For mechanical inventions, domestic manufactures, &c.	Number of persons who received premiums & gratuities.
Massachusetts, . . .	–	$1,000 00	–	$225 00	–	–	2
Essex, ...	$20 50	30 00	–	60 00	–	$78 00	266
Middlesex, . . .	16 50	–	–	60 00	–	32 00	154
Middlesex South, . .	19 25	70 00	–	60 00	–	62 57	182
Middlesex North, . .	–	–	–	60 00	–	34 50	193
Worcester, . . .	28 00	22 00	–	60 00	–	8 00	81
Worcester West, . .	2 00	30 00	–	60 00	–	53 50	127
Worcester North, . .	3 00	50 00	–	75 00	$8 75	109 99	165
Worcester South, . .	3 00	35 00	–	75 00	–	60 25	126
Worcester South East, .	20 00	25 00	–	45 00	2 00	69 00	195
Hampshire, Franklin and Hampden, .	22 50	20 00	–	90 00	–	105 00	231
Hampshire, . . .	1 50	10 00	–	30 00	1 00	97 25	174
Highland, . . .	–	–	–	45 00	–	27 50	128
Hampden, . . .	–	25 00	–	60 00	96 49	–	202
Hampden East, . .	1 00	30 00	–	60 00	–	56 25	89
Franklin, . . .	4 00	10 00	–	45 00	–	74 00	140
Berkshire, . . .	25 00	–	–	60 00	–	172 50	260
Housatonic, . . .	17 00	–	–	45 00	20 00	49 50	183
Hoosac Valley, . .	6 00	–	–	60 00	–	36 50	139
Norfolk, ...	21 00	30 00	–	60 00	–	47 00	124
Bristol, ...	5 50	45 00	$20 00	60 00	–	140 00	336
Plymouth, . . .	25 00	60 00	–	60 00	–	210 65	457
Barnstable. . . .	–	8 00	5 00	60 00	–	78 03	182
Nantucket, . . .	–	8 00	5 00	60 00	–	20 00	81
Martha's Vineyard, .	–	30 00	–	60 00	–	31 21	121
Totals, . . .	$240 75	$1,538 00	$30 00	$1,640 00	$128 24	$1,673 20	4,338

Names of the Towns and Cities to which the Premiums and Gratuities were disbursed, and the amount to each.

MASSACHUSETTS.

Barre,	$100 00	Concord,	$100 00

ESSEX.

Andover,	$10 00	Manchester, N. H.,	$2 00
Beverly,	8 50	Marblehead,	20 25
Boxford,	17 00	Methuen,	23 00
Bradford,	1 00	Middleton,	9 25
Brighton,	1 00	Newbury,	35 00
Byefield,	5 00	Newburyport,	19 00
Danvers,	72 50	North Andover,	62 00
Essex,	12 00	Rowley,	4 00
Gloucester,	4 00	Salem,	105 50
Groveland,	6 00	South Danvers,	165 50
Hamilton,	14 00	Swampscott,	5 00
Haverhill,	9 00	Topsfield,	11 00
Ipswich,	8 00	Wenham,	2 00
Lawrence,	4 00	West Newbury,	35 00
Lynn,	16 00	Worcester,	3 00
Lynnfield,	3 50	Total,	$742 25
Manchester,	19 25		

MIDDLESEX.

Acton,	$35 55	Bedford,	$15 60
Ashby,	4 00	Belmont,	14 30

MIDDLESEX—Continued.

Billerica, ...	$12 00	Lynn, ...	$1 00
Boston, ...	1 00	Marlborough, . . .	6 75
Cambridge, . . .	26 00	Pepperell, ...	12 00
Carlisle, ...	3 50	Saxonville, ...	6 60
Chelmsford, . . .	8 80	Sudbury, ...	14 80
Concord, ...	261 55	Wayland, ...	13 70
Dracut, ...	18 70	West Cambridge, . .	5 50
Franklin, ...	2 00	Westford, ...	1 00
Groton, ...	5 50	Weston, ...	3 50
Kingston, ...	5 00	Winchester, . . .	4 00
Lexington, ...	5 20	Woburn, ...	6 00
Lincoln, ...	22 40	Worcester, ...	50
Littleton, ...	8 10	Total, ...	$526 55
Lowell, ...	2 00		

MIDDLESEX SOUTH.

Ashland, ...	$22 50	Sherborn, ...	$2 75
Framingham, . . .	273 22	Southborough, . . .	58 75
Holliston, ...	13 75	Sudbury, ...	30 50
Hopkinton, ...	4 75	Wayland, ...	11 25
Marlborough, . . .	13 75	Other towns, . . .	5 00
Natick, ...	30 50	Total, ...	$170 72
Newton, ...	4 00		

MIDDLESEX NORTH.

Billerica, ...	$13 75	Dracut, ...	$54 00
Chelmsford, . . .	59 50	Dunstable, ...	78 00

MIDDLESEX NORTH—Continued.

Lowell,	$166 25	Westford,	$12 25
Tewksbury,	60 25	Total,	$193 00
Tyngsborough,	49 00		

WORCESTER.

Barre,	$27 00	Southborough,	$15 00
Grafton,	58 00	Sutton,	22 00
Holden,	8 00	Uxbridge,	7 00
Millbury,	11 00	Warren,	5 00
New Braintree,	8 50	Webster,	6 00
Northborqugh,	4 00	Westborough,	25 00
Oakham,	4 00	West Boylston,	26 00
Princeton,	7 00	Worcester,	247 00
Rutland,	5 00	Total,	$501 50
Shrewsbury,	10 50		

WORCESTER WEST.

Athol,	$9 75	Oakham,	$20 00
Barre,	188 50	Petersham,	18 50
Gardner,	1 00	Phillipston,	3 00
Hardwick,	34 00	Templeton,	75
Hubbardston,	4 00	Total,	$281 50
New Braintree,	2 00		

WORCESTER NORTH.

Ashburnham,	$11 50	Fitchburg,	$324 64
Ashby,	13 50	Gardner,	50

WORCESTER NORTH—CONTINUED.

Lancaster,	$9 50	Sterling,	$4 25
Leominster,	35 25	Templeton,	25
Littleton,	6 00	Westminster,	21 25
Lunenburg,	23 00	Total,	$144 64
Princeton,	4 00		

WORCESTER SOUTH.

Brimfield,	$15 50	Southbridge,	$69 50
Brookfield,	11 00	Spencer,	3 00
Charlton,	36 75	Sturbridge,	160 75
Dudley,	16 00	Warren,	13 50
North Brookfield,	75	Total,	$360 25
Oxford,	50		

WORCESTER SOUTH-EAST.

Bellingham,	$14 50	Northbridge,	$3 00
Blackstone,	19 25	Sherborn,	2 00
Holliston,	28 25	Upton,	11 50
Hopkinton,	31 25	Uxbridge,	31 75
Medway,	8 00	Worcester,	3 00
Mendon,	55 75	Total,	$103 00
Milford,	188 75		

HAMPSHIRE, FRANKLIN AND HAMPDEN.

Amherst,	$2 00	Bernardston,	$25 00
Belchertown,	5 00	Chesterfield,	7 00

HAMPSHIRE, FRANKIN AND HAMPDEN—Continued.

Chicopee,	$6 00
Cummington,	13 00
Deerfield,	25 50
Easthampton,	51 00
Goshen,	5 00
Granby,	6 00
Greenfield,	3 00
Hadley,	47 00
Hatfield,	39 00
Huntington,	4 00
Middlefield,	1 00
Northampton,	300 75
Shelburne,	$59 00
South Deerfield,	8 25
South Hadley,	16 25
Southampton,	74 00
Springfield,	3 50
Sunderland,	9 00
Westfield,	37 00
Westhampton,	22 00
Whately,	15 50
Worthington,	6 00
Total,	$793 75

HAMPSHIRE.

Amherst,	$147 72
Belchertown,	30 20
Enfield,	6 00
Granby,	5 00
Greenfield,	7 50
Hadley,	56 21
Leverett,	17 20
Northampton,	1 00
Palmer,	$5 00
Pelham,	54 25
Plainfield,	1 38
Shutesbury,	3 00
South Hadley,	10 00
Sunderland,	27 71
Total,	$371 92

HIGHLAND.

Ashfield,	$1 00
Becket,	70 25
Blandford,	5 00
Chester,	$59 25
Cummington,	6 00
Hinsdale,	46 25

HIGHLAND—CONTINUED.

Huntington,	$4 00
Lee,	50
Middlefield,	131 25
Northampton,	50
Otis,	1 00
Peru,	21 75
Pittsfield,	$7 50
Washington,	2 00
Windsor,	14 00
Worthington,	17 50
Total,	$387 75

HAMPDEN.

Agawam,	$14 25
Brimfield,	5 00
Chicopee,	16 00
Chicopee Falls,	75
Holyoke,	10 75
Longmeadow,	75
Ludlow,	1 00
Southwick,	15 50
Springfield,	123 85
Westfield,	16 25
West Springfield,	56 25
Wilbraham,	36 77
	$292 12*

Maine,	$150 00
Vermont,	100 00
Massachusetts,	1,167 50
Connecticut,	1,126 25
New York,	1,345 00
Virginia,	106 00
	$3,988 75†

HAMPDEN EAST.

Belchertown,	$10 00
Brimfield,	24 00
Monson,	70 75
Palmer,	119 25
Warren,	$17 50
Wilbraham,	18 50
Total,	$260 00

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* County Fair.

† Horse Show.

FRANKLIN.

Ashfield,	$5 00	Heath,	$5 00
Bernardston,	11 50	Leverett,	56
Buckland,	5 00	Leyden,	10 50
Colrain,	9 00	Montague,	8 25
Conway,	12 50	Northfield,	9 00
Deerfield,	31 00	Shelburne,	137 50
Erving,	3 00	Sunderland,	5 00
Gill,	3 00	Whately,	2 00
Greenfield,	103 50	Total,	$377 31

BERKSHIRE.

Adams,	$72 00	New York,	$100 00
Becket,	9 00	Peru,	10 00
Cheshire,	42 00	Pittsfield,	363 00
Dalton,	51 00	Richmond,	26 50
Egremont,	13 00	Sheffield,	16 50
Great Barrington,	3 00	Stockbridge,	52 00
Hancock,	12 00	Washington,	5 00
Hinsdale,	14 00	West Stockbridge,	4 00
Lanesborough,	142 00	Williamstown,	26 00
Lee,	46 50	Windsor,	24 00
Lenox,	153 50	Total,	$1,188 00

HOUSATONIC.

Alford,	$13 00	Lee,	$23 00
Egremont,	86 25	Lenox,	22 00
Great Barrington,	200 50	Monterey,	36 50

HOUSATONIC—Continued.

Mount Washington,	$6 00
North Marlborough,	11 00
Pittsfield,	18 00
Richmond,	18 00
Salisbury,	2 00
Sheffield,	163 25
Stockbridge,	$128 50
Tyringham,	25 00
West Stockbridge,	10 00
Worcester,	4 00
Total,	$802 00

HOOSAC VALLEY.

Adams,	$173 50
Cheshire,	4 00
Clarksburg,	10 50
Florida,	36 00
Hinsdale,	4 00
Lanesborough,	4 00
Pownall,	$8 50
Savoy,	5 00
Stamford,	9 00
Williamstown,	73 00
Windsor,	7 00
Total,	$334 50

NORFOLK.

Boston,	$12 00
Brookline,	6 00
Canton,	16 00
Dedham,	134 00
Dorchester,	67 00
Dover,	57 00
Foxborough,	46 00
Franklin,	8 00
Medfield,	21 00
Medway,	29 00
Milton,	37 00
Needham,	$54 50
Randolph,	2 00
Roxbury,	25 00
Sharon,	15 50
Stoughton,	42 00
Walpole,	8 00
West Roxbury,	35 00
Weymouth,	2 00
Wrentham,	12 00
Total,	$629 00

BRISTOL.

Acushnet,	$4 00
Attleborough,	21 50
Berkley,	32 00
Dartmouth,	1 50
Dighton,	11 25
Easton,	9 75
Fairhaven,	2 00
Fall River,	6 00
Halifax,	50
Mansfield,	27 75
New Bedford,	$10 50
Norton,	72 75
Raynham,	180 00
Rehoboth,	16 75
Seekonk,	14 75
Somerset,	5 75
Swanzey,	50
Taunton,	492 45
Worcester,	6 00
Total,	$915 70

PLYMOUTH.

Abington,	$8 50
Bridgewater,	231 50
Boston,	20 00
Carver,	11 75
Duxbury,	12 87
East Bridgewater,	137 62
Halifax,	18 00
Hanover,	6 00
Hanson,	2 37
Hingham,	62
Kingston,	10 37
Lakeville,	25 50
Mattapoisett,	$0 75
Middleborough,	56 00
North Bridgewater,	92 00
Pembroke,	3 25
Plymouth,	65 00
Plympton,	7 25
Rochester,	2 25
Wareham,	1 50
West Bridgewater,	85 00
Total,	$798 10

BARNSTABLE.

Barnstable,	$418 73	Harwich,	$2 62
Brewster,	9 25	Orleans,	10 50
Chatham,	5 50	Sandwich,	24 87
Dennis,	3 00	Unknown,	12 25
Eastham,	4 00	Yarmouth,	43 87
Falmouth,	7 12	Total,	$541 71

NANTUCKET.

Nantucket,	$295 73

MARTHA'S VINEYARD.

Chilmark,	$55 12	Tisbury,	$105 64
Edgartown,	16 20	Total,	$176 96

ABSTRACT OF RETURNS

OF THE

AGRICULTURAL SOCIETIES

OF

MASSACHUSETTS,

FOR

1860.

EDITED BY

CHARLES L. FLINT,

SECRETARY OF THE STATE BOARD OF AGRICULTURE.

BOSTON:
WILLIAM WHITE, PRINTER TO THE STATE.
1861.

OFFICERS OF THE AGRICULTURAL SOCIETIES,

1861.

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Secretary—PETER C. BROOKS, Jr., of Boston.

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President—ALLEN W. DODGE, of Hamilton.
Secretary—CHARLES P. PRESTON, of Danvers.

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AGRICULTURE OF MASSACHUSETTS.

AGRICULTURE AN ART.

From an Address before the Essex Agricultural Society.

BY JOHN L. RUSSELL.

The cultivation of the earth is of three kinds—the traditional, the artistic, and the scientific. The first employs all the most approved methods which have been known from the earliest days of farming in a country, and carries with it errors and prejudices. Myths and fables do not belong exclusively to ancient religions, but occur equally in old fashioned customs. There is the mythical and fabulous in agriculture as well as in antiquity, properly so called. In certain parts of every country the old fashioned customs still are to be found, and the farmer's occupation comes in largely for its share. The plough, the hoe, the scythe, the kinds of grain sown, the mode of manuring the land, the incorrect inferences about the modes of working it, the average crops from year to year, all exhibit the myths of olden customs. The internal arrangement of the household, the style of the dairy rooms, the surroundings of the dwelling, the aspect of things about the farm, mark the reign of an age which ought to have passed away. Even the private habits of some farmers,—their social and civil relations, show how little agricultural fairs and exhibitions have done for them. Converse with such men and women, and you will find them full of wise saws and signs, and superstitions; but take no note of the "signs of the times" in which they live. The traditional cultivation of the earth leaves the farm less valuable from generation to generation, until at last emigration to more fertile and virgin soils is the final resort.

Agriculture can be pursued, however, as an art, and hold its rank among the most honorable labors of mankind. We honor the artisan who builds nobly and well,—who rears the palace, the capitol, the sacred fane. The names of such men live long after their marvellous works have been touched rudely by the finger of time. It will be equally so with the artist of agriculture, who designs and executes from the rude area of a given piece of earth some fertile and smiling homestead, to bear to distant generations his prospective wisdom. Man rises from the lowest to the highest grade of social life as his mind craves, and seeks, and finds its needs. In no pursuit else do we see this so plainly as in agriculture. The most ignorant, careless and improvident condition is that of the savage. Except in form and cunning, the savage man is no higher than the brute he pursues for excitement or for food. The cravings of hunger prompt him to periodical exertion, and the wild fruits and the game are his food. The selection of certain kinds of seeds and fruits opens the way to their increase, and when he selects such to commit them to the ground, waiting for *their* seeds in turn, he enters the barbarous age. But he must be likewise on the search for other means of subsistence while the seeds are vegetating and the fruits are coming to perfection ; and this induces the nomadic habits, such as the Indian of our country is, and such as the earlier shepherd-tribes were. To this condition of man we owe the undoubted origin of many of our most valuable animals and cultivated plants ; and the Indian corn, the pumpkin, water-melon, beans, squash, all lay us under obligation to those nomadic tribes which were found here when the earliest missionaries visited these shores, previous to the colonies established by our ancestry.

The barbarous age in agriculture still lingers, and the mythical or traditional, to which I alluded, is no more than its highest form and extremest development. It prompts the idle and the unthrifty to emigrate from their homes to the Far West, in hopes to find in its virgin soils some excuse for negligence and unthrift. But it carries with it its own ruin, and impoverishes in turn, by exhaustion, the most fertile natural portions of the earth's surface, be it the alluvial soils and green mountains of Vermont, or the broad prairies of Kansas ! The industry, perseverance and art, which are essential to successful cultivation, with us bring their own reward. It has been long noticed that the physical, moral and intellectual conditions of a people depend on climatic characters; and the harder the soil and more obstinate the earth, the freer and more developed the race which subdues it. The circumstances which develop intelligence, enable intelligence in turn to develop the utmost possibilities; and when man emerges from barbarism, which only feeds and clothes his body, into civilization, he rises to the fine arts, whether in the primeval occupation of agriculture, or in those more æsthetical pursuits by which he builds finely and conceives and executes works of beauty and wonder which will for centuries endure.

Agriculture, considered in the light of an art, is no longer the confined and selfish consideration of how to feed and clothe a family or the dwellers on a given area of the farm; mere labor of the most uncultivated kind can do as much; rather than this little and narrow view, it becomes a branch of national industry, and maintains relations to the prosperity of a country. The object is now to make the most returns from the outlay; to enable the land from year to year to yield five-fold and ten-fold; to swell the aggregate sum of a state's productive resources; to invite capital to invest in its speculations; to convert sterility into fruitfulness; to anticipate exigencies for future time; to leave the world better than it was found, and restore to the primal paradise the portions cursed by the ignorance and selfishness of man. You are familiar, gentlemen, with the name of Downing, who is considered in this country what Paxton is in England; men estimate him not so much by his knowledge and descriptions of fruits and fruit trees, as by his endeavors to introduce correct ideas of landscape gardening—of the construction of elegant and commodious dwellings, and of a higher style of life in the pursuit of horticulture; to which science he was devoted. The art of agriculture does in the grander modes what landscape gardening does in the narrower; and there can be no reason why the most ordinary farm in Essex County should not borrow something from a higher style, to improve it and enhance its value.

The time may be distant when in this country we shall be obliged to cultivate as carefully and scrupulously as is needful in older and more thickly settled countries, yet there can be no excuse for neglecting to obtain the greatest advantages from agriculture which lie in our power. I remember hearing an educated man, who managed a farm, many years ago, say that he built him a new, fine barn, with many improvements, which at that time and place were considered merely whims and crotchets, because he could not afford to build a cheaper and meaner one, and his old one would not serve his purpose any longer; but I did not then catch the idea of the true economy which he had anticipated in the change. So agriculture as an art, holding its place high among other arts of civilized life, may not commend itself at once to every one, yet such fairs and annual exhibitions as this, attest to the increasing favor the idea is receiving in the community. We discover in the laws which govern the material world, that the circle and the spire pervade all developing objects. The same order which heaves planet and satellite around the central sun, arranges the growth of the stem and the position of the leaves of the smallest or most gigantic plant. The track which man progressively follows in his changes from epochs and seasons of development, brings him back to some starting point in his course. The garden in the sacred Scriptures is spoken of as man's first residence, and it is the garden which is his last and highest effort in civilized life. The farm can be a garden full of all manner of trees and herbs good for food and pleasure. Your most productive farming operations cease to wear the aspect of what would have been the case not many years ago.

A well laid out and carefully cultivated garden ranks among the highest efforts of artistical skill. In it the useful, ornamental and essential all combine. In one department may be found the forest trees, in another the fruit trees, another the kitchen stuffs, another herbs and perhaps flowers. Every superfluous plant is there an unsightly weed, and is carefully extirpated. The first settlers in a new country find the forests usurping the soil. They must be removed to allow the sun's rays to reach the earth. To destroy is the first of the circle, but ere it ends, harmoniously to re-produce will be essential. An agricultural district, pursuing the art of husbandry, takes as much care to preserve a due balance of relations as does the most skilful gardener. It may be found essential to plant again the very products the axe a century before was brought into play to destroy. Nicety of operation in sowing, weeding, studying the character of the soil, adaptation of this or that manure to this or that field, will pay as well as the same means in the garden. We see this in what is called market gardening; and the most ready returns are from such farms as pursue the course which improved husbandry recommends.

But no art can successfully be pursued without a science to aid and assist; to prompt the labor and to point out the course. Hence arises science of agriculture, which has enlisted the labors of a Davy, Humboldt, Liebig, and many other illustrious names in Europe beside. It were hardly to be expected in a country like ours, so young, (and yet so old,) but with so many vocations open to its inhabitants, seemingly more honorable, and easier of pursuit than agriculture, (but alas! too often the reverse,) that the same careful solicitude for its advancement should have yet arisen here as abroad. The foresight and prospective wisdom of our greatest and most distinguished patriots have strongly recommended some action in our institutions of learning towards the enlightened pursuit of agriculture. But the precise method of inducing the study of farming as other studies are sought, is a difficult question to solve, and may not be easily pointed out. I do not pretend to offer you, gentlemen, any plan of my own, from ignorance of what has been done, and from inability to devise such. Yet it appears to me evident that the first obstacle in our way is the too common idea that other pursuits are more honorable than that of the cultivation of the soil. There perhaps is a good deal, too, in the remark that the highest kinds of agriculture are expensive and will not pay; and that artistic and scientific farming will do well enough for the capitalist, who can afford to lose money if needful. I think the root of this mistake lies deeper than this surface view. Agricultural schools and colleges may be well enough, but they seem to me to have objectionable features. I have found among our academies and high schools, for instance, where there is any unusual amount of apparatus, that there generally is the most ignorance of the science it is intended to illustrate.

The universal eagerness for office affects every branch of our social industry. The consequence is apt to be the appointment of incompetent teachers and professors; and the very richness and abundance of the apparatus of the establishment might affect injuriously the actual practical knowledge which is sought. The State of Massachusetts provides most generously four Normal Schools in which both sexes are taught "how to teach." From these seminaries issue from year to year intelligent young men and young women, the majority of whom go into our agricultural towns, and are employed in teaching the rudiments of an English education. Others assume important stations in schools of higher grade elsewhere. The Board of Education appropriates sums of money for familiar lectures on chemistry and other sciences. I have authority for saying, that it is its wish that the relation of the vegetable economy to agriculture should be taught those who are to teach again. I look with much expectation to the future for the diffusion of better ideas on this subject through our common schools. Much of my correspondence with friends who are teachers, shows the tendency of the public mind in this direction. We should then insist on studies among primary schools connected with the science of agriculture. At its very basis lies the science of botany. No science else so refined, elegant, elevating to the mind; none so delicately suited to the feminine tastes. There is no reason why every boy and girl should not know about the very weeds, which look into their school-house door, as much as about the multiplication table. Is not the structure, composition, uses, economical and artistical, of the wood that is consumed in the stove, as worthy an hour's lesson as that of the rivers of countries scarcely trodden by man? In some towns the areas of school-houses are set with flowers and ornamental trees; this is well, provided the arrangement does not abridge the play-ground for athletic and health-inducing sports.

But the science of botany needs no such botanical gardens for its apparatus; every dry reed-stalk left by the winter winds, every little weed, every green moss, are book and lesson and apparatus, to a mind healthy and properly instructed how to instruct. You will allow me to urge this point on your attention, gentlemen, for many of you are members of school committees I do not doubt. Would you wish to induce your sons to settle down near the old family hearth and pursue the noble labor of the farm, do all you can to make the farm the most attractive. See that the teachers you employ can teach something that is connected with the business you love and which you wish should be developed and elevated. It is a common law that every need has some supply near at hand; create that need and the supply will follow. What money and pecuniary offers fail to effect, however liberal you may be in that direction, taste and conviction arising from education will do. Adorn your dwellings with flowers, and encourage your children to cultivate them. Many a useful, natural bent in the young has been lost by injudicious and thoughtless levity. Believe that an hour is not lost which your wife, or your daughter, or your son spends in the garden, among the flowers which they have learned to love. Labor is relieved of half its toil when smiled upon by the elegancies of life. I have been no heedless witness of these facts, and the most industrious hands and the most loving and motherly hearts have I found among those who cultivated the tulip bed or nourished the rose bush in some corner of the farm yard, amidst discouragements which would have appalled the sterner sex had they been suffered to exist where the corn and the potato patch stood.

" The farmer's garden," says Elihu Burrit, " is the introduction to a large volume, of which every acre is a page, bearing the marks of his character. Viewed in this light, the gardens of New England are full of hopeful and instructive reading to those who consult their chronicles. They show that science, taste and successful industry have been brought to bear upon agriculture. They mark the degree of mental culture and refinement to which the farmers of the country have attained." Let our common school teachers, I repeat, understand that they are expected to communicate such knowledge or go without employment, and my word for it, you will find them all apt and fit for the task. In this town, close by, stands a noble monument of gratitude to and love of the birthplace of one, who went from you a boy and returned to an ovation such as is seldom granted to what the world calls great men. Beneath its roof stand volumes of wisdom, science, art, freely offered to every citizen. Not far off is its duplicate library, in which are choice books, and which I have been generously invited to consult. Its lecture room affords easy facilities to any one to listen to the eloquence or to quaff from the fountains of knowledge, which the lyceum lecturer offers you. We admire such generosity, such thoughtful care for the rising generation.

But is it too much to expect that what George Peabody has done for his native town, others may do in some other way for theirs, and that an enlightened agriculture may lay the foundation of a similar rural fortune to the village where it is pursued?

If agriculture as a science is to become the great national enterprise of a free people, can we who encourage and foster it by agricultural fairs, exhibitions of stock and produce, by our libraries and premiums, do too much in our means of primary education to advance it? Set out well and carefully the young tree, and you need not fear that under ordinary circumstances, you will be disappointed in the fruits. Elevate your calling, gentlemen, and you open avenues of usefulness and wealth, surer and as honorable as commerce or mercantile pursuits. The science, which prompts your labors and which induces your children to love the old homestead so well that they will not leave it for the uncertain gain of other trades, will not necessarily involve you in expensive habits or ruinous enterprises. The reason why we see such is not from the science, but from its want. In all pursuits there is necessarily much pretence, yet that does not prevent the pursuit of the real and substantial. True science is accurate, patient and rewarding; empiricism is pretentious and false. Every evil has its remedy, and if not in our generation yet in one to come, and for which we should labor in our day, will be enlisted in your noble calling the very highest and surest names in those departments of knowledge and inquiry, which are connected with the cultivation of the earth.

I suggested, in the early part of my remarks, that the eye was through the hand, the great minister to the supply of useful knowledge and practical wisdom. Clearly then, it was intended in such a beneficent gift, that we were expected to observe. This duty of seeing, of observing, devolves upon the farmer in the most minute particulars of his calling. How quick your eye detects the symptoms of disease in your stock; and how much is done by practice. Deficiency of points in your horse you will notice, which might escape others. The same holds good in the minutiæ of your crops, and the most careful criticism is worthy your care. On such observation, constant, daily, perpetual, the most ordinary and the most extensive labors of science depend. Many entertain the idea that the study of the natural sciences ought to find the cure, remedy, preventive to every injury occurring from bird, insect, or vegetable depredator. What, it is asked, is the use of entomology, if you naturalists cannot tell us how to drive away the canker worm, striped bug, caterpillar? Such an objection is, however, not worthy a generous mind. The same would lie against all the learned professions, as they are called, if pressed to the ultimate limit.

The difference between observation and patient inquiry on the part of the farmer and a refusal to see and observe, is that between ignorance and inquiry—darkness and illumination. Would he be considered wise who should refuse a lantern in a dark night, because it were not a lighted gas jet or the sun? A natural inclination or an early taste for such observation cannot be too much commended. The onion crop has severely suffered from an offensive larva, whose habits are worth noting from year to year. The remedy against it has not yet been discovered—perhaps it never will; it is better to know your foe and its capabilities to mischief than to persevere in the culture of that root crop against so many disadvantages. I should hardly hope to prophecy a future exemption from any application or from any new variety of the plant, after what has been tried by so many farmers. The habits of insects are mysterious as yet, and we can only hope to profit by eternal vigilance. It seems significant to me, however, that the fly belongs, apparently, to the scatophagous tribes, which nestle and deposit their eggs in particular kinds of manures especially. Total abandonment of this vegetable as field crop for a series of years, may, by depriving each generation of the proper nidus for its larva, cause its extermination; and though we may mourn when we think of the "leeks of Egypt," our children may enjoy by our abstinence greater advantages when the root can be cultivated again with success.

It is too common, in absence of other knowledge, to infer that what is known abroad of similar facts, is identical with what we desire to know at home. But I think it may be concluded that every cultivated country has its own peculiar disorders, diseases and parasitical complaints. I would speak more particularly of plants, which are more familiar to me; and aver that many of the most insidious kinds of mildews, blights, brands and smuts, are structurally and typically our own. The naturalist who would investigate these may find them only analogous to foreign species, and from atmospherical conditions requiring different treatment. We need then, an American system of science, based upon American facts in nature.

Our culture too should be American, suited to our soils, climate, productions, to *our* fruits, grains, seeds, roots. I would by no means discourage experiments with approved foreign kinds, yet such experiments should be not hastily or widely adopted. Mr. David Landreth, an experienced seedsman, found among fifty-two specimens of turnips raised from seed imported by him, but *two* varieties worthy of perpetuation. In the subject of grass seeds, too, the knowledge of the actual species can only prevent disappointment in sections where they are unfitted to the soil or latitude. Mr. Ives has shown in your "Transactions" how coincident with the soils are the varieties of apples and pears: what English kinds succeed, to what extent American varieties can be distributed through these United States. The potato rot presents a similar aspect, and in vain were the journals of Europe searched for the cause. Even the fungi described by the mycologists abroad did not occur on our own, and this insidious destroyer has baffled the most careful experiments to detect the reason of its presence. Is it a waste of time and study which has hitherto been expended to find the cause and remedy? Then equally wasteful the patient hours of the kind and generous physician, who has sought in vain for the reason and cure of pulmonary disease, or who has risked his own life to detect the seeds and germs of the cholera, which affrights and devastates nations. Equally so is the rot in the grape, which by the western vine-grower has been thought identical. But agriculture with its science must not borrow from abroad; it must build schools of American science, observation and research. Its soils are to be analyzed by its own chemists, its plants which grow upon them analyzed and specified by its own botanists, and the fields that are to be reaped should be sown with its own seeds. Is it too much to expect that from resources as great naturally as are to be found elsewhere, products as mighty and great can accrue?

SUCCESSION OF FOREST TREES.

From an Address before the Middlesex Agricultural Society.

BY HENRY D. THOREAU.

I have often been asked, as many of you have been, if I could tell how it happened, that when a pine wood was cut down, an oak one commonly sprang up, and *vice versa*. To which I have answered, and now answer, that I can tell—that it is no mystery to me. As I am not aware that this has been clearly shown by any one, I shall lay the more stress on this point. Let me lead you back into your wood-lots again.

When, hereabouts, a single forest tree or a forest springs up naturally where none of its kind grew before, I do not hesitate to say, though in some quarters still it may sound paradoxical, that it came from a seed. Of the various ways by which trees are *known* to be propagated—by transplanting, cuttings, and the like—this is the only supposable one under these circumstances. No such tree has ever been known to spring from any thing else. If any one asserts that it sprang from something else, or from nothing, the burden of proof lies with him.

It remains, then, only to show how the seed is transported from where it grows to where it is planted. This is done chiefly by the agency of the wind, water and animals. The lighter seeds, as those of pines and maples, are transported chiefly by wind and water; the heavier, as acorns and nuts, by animals.

In all the pines, a very thin membrane, in appearance much like an insect's wing, grows over and around the seed, and independent of it, while the latter is being developed within its base. Indeed this is often perfectly developed, though the seed is abortive, nature being, you would say, more sure to provide the means of transporting the seed, than to provide the seed to be transported. In other words, a beautiful thin sack is woven around the seed, with a handle to it such as the wind can take hold of, and it is then committed to the wind, expressly that it may transport the seed and extend the range of the species; and this it does as effectually as when seeds are sent by mail in a different kind of sack from the patent office. There is a patent office at the seat of government of the universe, whose managers are as much interested in the dispersion of seeds as any body at Washington can be, and their operations are infinitely more extensive and regular.

There is, then, no necessity for supposing that the pines have sprung up from nothing, and I am aware that I am not at all peculiar in asserting that they come from seeds, though the mode of their propagation *by nature* has been but little attended to. They are very extensively raised from the seed in Europe, and are beginning to be here.

When you cut down an oak wood, a pine wood will not *at once* spring up there unless there are, or have been, quite recently, seed-bearing pines near enough for the seeds to be blown from them. But, adjacent to a forest of pines, if you prevent other crops from growing there, you will surely have an extension of your pine forest, provided the soil is suitable.

As for the heavy seeds and nuts which are not furnished with wings, the notion is still a very common one that, when the trees which bear these spring up where none of their kind were noticed before, they have come from seeds or other principles spontaneously generated there in an unusual manner, or which have lain dormant in the soil for centuries, or perhaps been called into activity by the heat of a burning. I do not believe these assertions, and I will state some of the ways in which, according to my observation, such forests are planted and raised.

Every one of these seeds, too, will be found to be winged or legged in another fashion. Surely, it is not wonderful that cherry trees of all kinds are widely dispersed, since their fruit is well known to be the favorite food of various birds. Many kinds are called bird-cherries, and they appropriate many more kinds, which are not so called. Eating cherries is a birdlike employment, and unless we disperse the seeds occasionally, as they do, I shall think that the birds have the best right to them. See how artfully the seed of a cherry is placed in order that a bird may be compelled to transport it—in the very midst of a tempting pericarp, so that the creature that would devour this must commonly take the stone also into its mouth or bill. If you ever ate a cherry, and did not make two bites of it, you must have perceived it—right in the centre of the luscious morsel, a large earthy residuum left on the tongue. We thus take into our mouths cherry stones as big as pease, a dozen at once, for Nature can persuade us to do almost any thing when she would compass her ends. Some wild men and children instinctively swallow these, as the birds do when in a hurry, it being the shortest way to get rid of them. Thus, though these seeds are not provided with vegetable wings. Nature has impelled the thrush tribe to take them into their bills and fly away with them, and they are winged in another sense, and more effectually than the seeds of pines, for these are carried even against the wind. The consequence is, that cherry trees grow not only here but there. The same is true of a great many other seeds.

But to come to the observation which suggested these remarks. As I have said, I suspect that I can throw some light on the fact, that when hereabouts a dense pine wood is cut down, oaks and other hard woods may at once take its place. I have got only to show that the acorns and nuts, provided they are grown in the neighborhood, are regularly planted in such woods; for I assert that if an oak tree has not grown within ten miles, and man has not carried acorns thither, then an oak wood will not spring up *at once* when a pine wood is cut down.

Apparently, there were only pines there before. They are cut off, and after a year or two you see oaks and other hard woods springing up there, with scarcely a pine amid them, and the wonder commonly is how the seed could have lain in the ground so long without decaying. But the truth is, that it has not lain in the ground so long, but is regularly planted each year by various quadrupeds and birds.

In this neighborhood, where oaks and pines are about equally dispersed, if you look through the thickest pine wood, even the seemingly unmixed pitch-pine ones, you will commonly detect many little oaks, birches, and other hard woods, sprung from seeds carried into the thicket by squirrels and other animals, and also blown thither, but which are overshadowed and choked by the pines. The denser the evergreen wood, the more likely it is to be well planted with these seeds, because the planters incline to resort with their forage to the closest covert. They also carry it into birch and other woods. This planting is carried on annually, and the oldest seedlings annually die; but when the pines are cleared off, the oaks, having got just the start they want, and now secured favorable conditions, immediately spring up to trees.

The shade of a dense pine wood is more unfavorable to the springing up of pines of the same species than of oaks within it, though the former may come up abundantly when the pines are cut, if there chance to be sound seed in the ground.

But when you cut off a lot of hard wood, very often the little pines mixed with it have a similar start, for the squirrels have carried off the nuts to the pines, and not to the more open wood, and they commonly make pretty clean work of it; and moreover, if the wood was old, the sprouts will be feeble or entirely fail; to say nothing about the soil being, in a measure, exhausted for this kind of crop.

If a pine wood is surrounded by a white oak one chiefly, white oaks may be expected to succeed when the pines are cut. If it is surrounded instead by an edging of shrub-oaks, then you will probably have a dense shrub-oak thicket.

I have no time to go into details, but will say, in a word, that while the wind is conveying the seeds of pines into hard woods and open lands, the squirrels and other animals are conveying the seeds of oaks and walnuts into the pine woods, and thus a rotation of crops is kept up.

I affirmed this confidently many years ago, and an occasional examination of dense pine woods confirmed me in my opinion. It has long been known to observers that squirrels bury nuts in the ground, but I am not aware that any one has thus accounted for the regular succession of forests.

On the 24th of September, in 1857, as I was paddling down the Assabet, in this town, I saw a red squirrel run along the bank under some herbage, with something large in its mouth. It stopped near the foot of a hemlock, within a couple of rods of me, and, hastily pawing a hole with its fore feet, dropped its booty into it, covered it up, and retreated part way up the trunk of the tree. As I approached the shore to examine the deposit, the squirrel, descending part way, betrayed no little anxiety about its treasure, and made two or three motions to recover it before it finally retreated. Digging there, I found two green pig nuts joined together, with the thick husks on, buried about an inch and a half under the reddish soil of decayed hemlock leaves—just the right depth to plant it. In short, this squirrel was then engaged in accomplishing two objects, to wit, laying up a store of winter food for itself, and planting a hickory wood for all creation. If the squirrel was killed, or neglected its deposit, a hickory would spring up. The nearest hickory tree was twenty rods distant. These nuts were there still just fourteen days later, but were gone when I looked again, November 21, or six weeks later still.

I have since examined more carefully several dense woods, which are said to be, and are apparently exclusively pine, and always with the same result. For instance, I walked the same day to a small, but very dense and handsome white-pine grove, about fifteen rods square, in the east part of this town. The trees are large for Concord, being from ten to twenty inches in diameter, and as exclusively pine as any wood that I know. Indeed, I selected this wood because I thought it the least likely to contain any thing else. It stands on an open plain or pasture, except that it adjoins another small pine wood, which has a few little oaks in it, on the south-east side. On every other side, it was at least thirty rods from the nearest woods. Standing on the edge of this grove and looking through it, for it is quite level and free from underwood, for the most part bare, red-carpeted ground, you would have said that there was not a hard wood tree in it, young or old. But on looking carefully along over its floor I discovered, though it was not till my eye had got used to the search, that, alternating with thin ferns, and small blueberry bushes, there was, not merely here and there, but as often as every five feet, and with a degree of regularity, a little oak, from three to twelve inches high, and in one place I found a green acorn dropped by the base of a pine.

I confess I was surprised to find my theory so perfectly proved in this case. One of the principal agents in this planting, the red squirrels, were all the while curiously inspecting me, while I was inspecting their plantation. Some of the little oaks had been browsed by cows, which resorted to this wood for shade.

After seven or eight years, the hard woods, evidently find such a locality unfavorable to their growth, the pines being allowed to stand. As an evidence of this, I observed a diseased red maple twenty-five feet long, which had been recently prostrated, though it was still covered with green leaves, the only maple in any position in the wood.

But although these oaks almost invariably die if the pines are not cut down, it is probable that they do better for a few years under their shelter than they would anywhere else.

The very extensive and thorough experiments of the English have at length led them to adopt a method of raising oaks almost precisely like this, which somewhat earlier had been adopted by nature and her squirrels here; they have simply re-discovered the value of pines as nurses for oaks. The English experimenters seem early and generally to have found out the importance of using trees of some kind as nurse plants for the young oaks. I quote from Loudon what he describes as "the ultimatum on the subject of planting and sheltering oaks"—an "abstract of the practice adopted by the government officers in the national forests" of England, prepared by Alexander Milne.

At first some oaks had been planted by themselves, and others mixed with Scotch pines; "but in all cases," says Mr. Milne, "where oaks were planted actually among the pines, and surrounded by them, [though the soil might be inferior,] the oaks were found to be much the best." "For several years past, the plan pursued has been to plant the inclosures with Scotch pines only, [a tree very similar to our pitch pine,] and when the pines have got to the height of five or six feet, then to put in good strong oak plants of about four or five years' growth among the pines—not cutting away any pines at first, unless they happen to be so strong and thick as to overshadow the oaks. In about two years, it becomes necessary to shred the branches of the pines, to give light and air to the oaks, and in about two or three more years to begin gradually to remove the pines altogether, taking out a certain number each year, so that, at the end of twenty or twenty-five years, not a single Scotch pine shall be left; although, for the first ten or twelve years, the plantation may have appeared to contain nothing else but pine. The advantage of this mode of planting has been found to be that the pines dry and ameliorate the soil, destroying the coarse grass and brambles which frequently choke and injure oaks; and that no mending over is necessary, as scarcely an oak so planted is found to fail."

Thus much the English planters have discovered by patient experiment, and, for aught I know, they have taken out a patent for it; but they appeared not to have discovered that it was discovered before, and they are merely adopting the method of Nature, which she long ago made patent to all. She is all the while planting the oaks amid the pines without our knowledge, and at last, instead of government officers, we send a party of wood-choppers to cut down the pines, and so rescue an oak forest, at which we wonder as if it had dropped from the skies.

As I walk amid hickories, even in August, I hear the sound of green pig-nuts falling from time to time, cut off by the chickaree over my head. In the fall, I notice on the ground, either within or in the neighborhood of oak woods, on all sides of the town, stout oak twigs three or four inches long, bearing half-a-dozen empty acorn-cups, which twigs have been gnawed off by squirrels, on both sides of the nuts, in order to make them more portable. The jays scream and the red squirrels scold while you are clubbing and shaking the chestnut trees, for they are there on the same errand, and two of a trade never agree. I frequently see a red or gray squirrel cast down a green chestnut bur, as I am going through the woods, and I used to think, sometimes, that they were cast at me. In fact, they are so busy about it, in the midst of the chestnut season, that you cannot stand long in the woods without hearing one fall. A sportsman told me that he had, the day before—that was in the middle of October—seen a green chestnut bur dropt on our great river meadow, fifty rods from the nearest wood, and much further from the nearest chestnut tree, and he could not tell how it came there. Occasionally, when chestnuting in mid-winter, I find thirty or forty nuts in a pile, left in its gallery, just under the leaves, by the common wood-mouse (*mus leucopus*.)

But especially in the winter the extent to which this transportation and planting of nuts is carried on is made apparent by the snow. In almost every wood, you will see where the red or gray squirrels have pawed down through the snow in a hundred places, sometimes two feet deep, and almost always directly to a nut or a pine-cone, as directly as if they had started from it and bored upward—which you and I could not have done. It would be difficult for us to find one before the snow falls. Commonly, no doubt, they had deposited them there in the fall. You wonder if they remember the localities, or discover them by the scent. The red squirrel commonly has its winter abode in the earth under a thicket of evergreens, frequently under a small clump of evergreens in the midst of a deciduous wood. If there are any nut-trees, which still retain their nuts, standing at a distance without the wood, their paths often lead directly to and from them. We, therefore, need not suppose an oak standing here and there *in* the wood in order to seed it, but if a few stand within twenty or thirty rods of it, it is sufficient.

I think that I may venture to say that every white-pine cone that falls to the earth naturally in this town, before opening and losing its seeds, and almost every pitch-pine one that falls at all, is cut off by a squirrel, and they begin to pluck them long before they are ripe, so that when the crop of white-pine cones is a small one, as it commonly is, they cut off thus almost every one of these before it fairly ripens. I think, moreover, that their design, if I may so speak, in cutting them off green, is, partly, to prevent their opening and losing their seeds, for these are the ones for which they dig through the snow, and the only white-pine cones which contain any thing then. I have counted in one heap, within a diameter of four feet, the cores of 239 pitch-pine cones which had been cut off and stripped by the red squirrel the previous winter.

The nuts thus left on the surface, or buried just beneath it, are placed in the most favorable circumstances for germinating. I have sometimes wondered how those which merely fell on the surface of the earth got planted ; but by the end of December, I find the chestnuts of the same year partially mixed with the mould, as it were, under the decaying and mouldy leaves, where there is all the moisture and manure they want, for the nuts fall first. In a plentiful year, a large proportion of the nuts are thus covered loosely an inch deep, and are, of course, somewhat concealed from squirrels. One winter, when the crop had been abundant, I got, with the aid of a rake, many quarts of these nuts as late as the 10th of January, and though some bought at the store at the same day were more than half of them mouldy, I did not find a single mouldy one among these which I picked from under the wet and mouldy leaves, where they had been snowed on once or twice. Nature knows how to pack them best. They were still plump and tender. Apparently, they do not heat there, though wet. In the spring they were all sprouting.

Loudon says that "when the nut [of the common walnut of Europe] is to be preserved through the winter for the purpose of planting in the following spring, it should be laid in a rot heap, as soon as gathered, with the husk on; and the heap should be turned over frequently in the course of the winter."

Here, again, he is stealing Nature's "thunder." How can a poor mortal do otherwise? for it is she that finds fingers to steal with, and the treasure to be stolen. In the planting of the seeds of most trees, the best gardeners do no more than follow Nature, though they may not know it. Generally, both large and small ones are most sure to germinate, and succeed best, when only beaten into the earth with the back of a spade, and then covered with leaves or straw. These results to which planters have arrived, remind us of the experience of Kane and his companions at the North, who, when learning to live in that climate, were surprised to find themselves steadily adopting the customs of the natives, simply becoming Esquimaux. So, when we experiment in planting forests, we find ourselves at last doing as Nature does. Would it not be well to consult with Nature in the outset? for she is the most extensive and experienced planter of us all, not excepting the Dukes of Athol.

In short, they who have not attended particularly to this subject are but little aware to what an extent quadrupeds and birds are employed, especially in the fall, in collecting, and so disseminating and planting the seeds of trees. It is the almost constant employment of the squirrels at that season, and you rarely meet with one that has not a nut in its mouth, or is not just going to get one. One squirrel-hunter of this town told me that he knew of a walnut tree which bore particularly good nuts, but that on going to gather them one fall, he found that he had been anticipated by a family of a dozen red squirrels. He took out of the tree, which was hollow, one bushel and three pecks by measurement, without the husks, and they supplied him and his family for the winter. It would be easy to multiply instances of this kind. How commonly in the fall you see the cheek-pouches of the striped squirrel distended by a quantity of nuts. This species get its scientific name *Tamias*, or the steward, from its habit of storing up nuts and other seeds. Look under a nut-tree a month after the nuts have fallen, and see what proportion of sound nuts to the abortive ones and shells you will find ordinarily. They have been already eaten, or dispersed far and wide. The ground looks like a platform before a grocery, where the gossips of the village sit to crack nuts and less savory jokes. You have come, you would say, after the feast was over, and are presented with the shells only.

Occasionally, when threading the woods in the fall, you will hear a sound as if some one had broken a twig, and looking up, see a jay pecking at an acorn, or you will see a flock of them at once about it, in the top of an oak, and hear them break them off. They then fly to a suitable limb, and placing the acorn under one foot, hammer away at it busily, making a sound like a wood pecker's tapping, looking round from time to time to see if any foe is approaching, and soon reach the meat, and nibble at it, holding up their heads to swallow, while they hold the remainder very firmly with their claws. Nevertheless, it often drops to the ground before the bird has done with it. I can confirm what William Bertram wrote to Wilson, the Ornithologist, that "The jay is one of the most useful agents in the economy of nature, for disseminating forest trees and other nuciferous and hard-seeded vegetables on which they feed. Their chief employment during the autumnal season is foraging to supply their winter stores. In performing this necessary duty they drop abundance of seed in their flight over fields, hedges, and by fences where they alight to deposit them in the post-holes, &c. It is remarkable what numbers of young trees rise up in fields and pastures after a wet winter and spring. These birds alone are capable, in a few years time, to replant all the cleared lands."

I have noticed that squirrels also frequently drop their nuts in open land, which will still further account for the oaks and walnuts which spring up in pastures, for, depend on it, every new tree comes from a seed. When I examine the little oaks, one or two years old, in such places, I invariably find the empty acorn from which they sprung.

So far from the seed having lain dormant in the soil since oaks grew there before, as many believe, it is well known that it is difficult to preserve the vitality of acorns long enough to transport them to Europe; and it is recommended in Loudon's Arboretum, as the safest course, to sprout them in pots on the voyage. The same authority states that " very few acorns of any species will germinate after having been kept a year," that beach mast " only retains its vital properties one year," and the black walnut, " seldom more than six months after it has ripened." I have frequently found that in November almost every acorn left on the ground had sprouted or decayed. What with frost, drouth, moisture, and worms, the greater part are soon destroyed. Yet it is stated by one botanical writer that " acorns that have lain for centuries, on being ploughed up, have soon vegetated."

Mr. George B. Emerson, in his valuable Report on the Trees and Shrubs of this State, says of the pines: " The tenacity of life of the seeds is remarkable. They will remain for many years unchanged in the ground, protected by the coolness and deep shade of the forest above them. But when the forest is removed, and the warmth of the sun admitted, they immediately vegetate." Since he does not tell us on what observation his remark is founded, I must doubt its truth. Besides, the experience of nurserymen makes it the more questionable.

The stories of wheat raised from seed buried with an ancient Egyptian, and of raspberries raised from seed found in the stomach of a man in England, who is supposed to have died sixteen or seventeen hundred years ago, are generally discredited, simply because the evidence is not conclusive.

Several men of science, Dr. Carpenter among them, have used the statement that beach-plums sprang up in sand which was dug up forty miles inland in Maine, to prove that the seed had lain there a very long time, and some have inferred that the coast has receded so far. But it seems to me necessary to their argument to show, first, that beach-plums grow only on a beach. They are not uncommon here, which is about half that distance from the shore, and I remember a dense patch a few miles north of us, twenty-five miles inland, from which the fruit was annually carried to market. How much further inland they grow, I know not. Dr. Charles T. Jackson speaks of finding "beach-plums" (perhaps they were this kind) more than one hundred miles inland in Maine.

It chances that similar objections lie against all the more notorious instances of the kind on record.

Yet I am prepared to believe that some seeds, especially small ones, may retain their vitality for centuries under favorable circumstances. In the spring of 1859, the old Hunt house, so called, in this town, whose chimney bore the date of 1703, was taken down. This stood on land which belonged to John Winthrop, the first governor of Massachusetts, and a part of the house was evidently much older than the above date, and belonged to the Winthrop family. For many years, I have ransacked this neighborhood for plants, and I consider myself familiar with its productions. Thinking of the seeds which are said to be sometimes dug up at an unusual depth in the earth, and thus to reproduce long extinct plants, it occurred to me last fall that some new or rare plants might have sprung up in the cellar of this house, which had been covered from the light so long. Searching there on the 22d of September, I found, among other rank weeds, a species of nettle (Urtica urens) which I had not found before; dill, which I had not seen growing spontaneously; the Jerusalem oak, (Chenopodium botrys) which I had seen wild in but one place; black nightshade (Solanum nigrum,) which is quite rare hereabouts, and common tobacco, which, though it was often cultivated here in the last century, has for fifty years been an unknown plant in this town, and a few months before this not even I had heard that one man in the north part of the town was cultivating a few plants for his own use. I have no doubt that some or all of these plants sprang from seeds which had long been buried under or about that house, and that that tobacco is an additional evidence that the plant was formerly cultivated here. The cellar has been filled up this year, and four of those plants, including the tobacco, are now again extinct in that locality.

It is true, I have shown that the animals consume a great part of the seeds of trees, and so, at least, effectually prevent their becoming trees; but in all these cases, as I have said, the consumer is compelled to be at the same time the disperser and planter, and this is the tax which he pays to nature. I think it is Linnæus who says that while the swine is rooting for acorns he is planting acorns.

THE STOCK ON OUR FARMS.

From an Address before the Worcester North Agricultural Society.

BY GEORGE B. LORING.

The subjugation of the animal kingdom to the wants and luxuries of man, constitutes one of the most interesting chapters in the history of practical human advancement. In the beginning, man was created " to have dominion over the fish of the sea, and over the fowl of the air, and over the cattle ;" and when by his " first disobedience " he was obliged to resign the enjoyment of reaping the spontaneous productions of the earth, for an unequal contest with thorns and thistles, no decree went forth to release the " beasts of the field " from their predestined bondage. The " bleating flocks " which welcomed the dawn of creation, were sacrificed to furnish the two first human sinners with " coats of skins," after their expulsion from Eden, into the chilling influences of the outer world ; and we are told that the second born on the face of the earth, occupied those primeval hours, amid new and oriental luxuriance, as a "keeper of sheep."

From that day to this, the production and care of animals adapted to human wants has been one of the most important branches of husbandry. We have no means of judging of the quality of Abel's sheep, " of the firstlings of his flock, and of the fat thereof." We only learn of Jacob's herds that they were " ring-streaked and speckled." And amidst all the elevation of Taurus the Bull into the heavenly constellations, of Apis into the catalogue of heathen deities ; amidst the poetic fancies which created the white bull of Europa, and adorned the ancient gate-ways and arches with the gaunt forms of stately oxen, and gave the name Boopis (ox-eyed) to the fairest goddess, and filled the classic song of Virgil with the voices of thronging cattle, and gave to the English poet the subdued and quiet picture, as

> "The lowing herd winds slowly o'er the lea,"

and expressed the climax of luxuriant possession in "the cattle upon a thousand hills,"—amidst all this we have never yet learned what skill and practical experience produced the foundation of such pleasing imagery, nor what rural economics guided the earliest farmers in their rearing of cattle.

There is, it is true, an old French proverb — "no cattle, no farming—few cattle, poor farming—many cattle, good farming." And we learn that when Cato, the wise and sagacious Roman, was asked "what was the most assured profit raising out of land?" made the answer—"To feed well." Being asked again, "what was the next?" he answered—"To feed with moderation." And we can easily imagine the contrast which exists between that aboriginal production of food, which the sinewy savage practices as he pursues the still more sinewy cattle across the plain, and even the first dawn of domestication in the management of animals—and the still greater contrast which exists between the wild and flying drover of the pampas, and that calm and solid and imperturbable specimen of humanity, who winds his placid way from the valley of the Tees to Smithfield market, realizing as he follows his rolling and wallowing Short-horns, the truth of the saying "who drives fat oxen should himself be fat." There is a long interval between "the five hundred yoke of oxen" of Job, and the stupendous breeds which graze upon the fat pastures of England, bred and reared by rule into an exact estimate of the cost of each "pound of flesh." And to us who are engaged in farming among all the modern improvements, it is a matter of special interest to know the processes by which the present breeds and races of cattle have been brought to their existing perfection, and how they can be preserved in their condition. An Ayrshire cow, and a Short-horn bullock, are by no means the result of accident. They have been produced by the application of the highest and most intelligent skill, at the hands of the Bakewells and Parkeses and Mickles and Collings, under whose treatment, as has been truly said, the "long-legged, slabsided, ill-bred oxen, are metamorphosed into small-boned, quick-fattening Devons and elephantine Durhams, (Short-horns); and the "lean, hurdle-backed Norfolk rams become beautiful firkin-bodied South Downs." We, in the United States, have the advantage of the experience and the profits of these distinguished and successful breeders; and it especially becomes us to inquire what advantage we can derive from all that they have done. We must have cattle adapted to our soil and climate, cattle which can be profitably fed, cattle which will make the best return for the labor and produce bestowed upon them.

I am aware that there is no breed of cattle universally adapted to the United States, or even to any one State. The valley of the Connecticut and the hills of Berkshire and Essex, in Massachusetts, differ almost as much as the valley of the Tees and Highlands of Scotland. And we shall find that, in selecting a breed of cattle for each locality, we must be obedient to nature, or nature will take the matter into her own hands, and will bring about a certain conformity between herself and the animals which she is to nourish. When I tell you that Short-horns have not thriven well in some parts of the New England States, and that Ayrshires have shown too great a disposition to take on fat in the rich pastures of Maryland, owing I think, to a bad selection of animals, to a great extent, you will understand what I mean by saying that nature will have her own way in these things.

Still the necessities and the interest of every community generally control its industry. We may learn from the statistics of Massachusetts cattle husbandry, what her people demand most in this branch of all the varieties of farming, large and small, among us. I find that in 1855 the number of cows and heifers in that State was 184,008—the number of oxen and steers was 77,511. The value of the cows and heifers was estimated at $4,892,291—the value of the oxen and steers was $3,246,341. The value of the dairy products of that year, consisting of milk, butter and cheese was $2,898,696.28.

In Pennsylvania, the number of milch cows is 530,224; of working oxen, 61,527; of other cattle, 562,195.

In New York, the number of milch cows is 931,324; of working oxen, 178,909; of other cattle, 767,406.

In Georgia, the number of milch cows is 334,223 ; of working oxen, 73,286 ; of other cattle, 690,019.

In Kentucky, the number of milch cows is 247,475 ; of working oxen, 62,274 ; of other cattle, 442,763.

In Illinois, the number of milch cows is 294,671 ; of working oxen, 76,156 ; of other cattle, 541,209.

These figures are very significant with regard to the animals most in demand among us. They show the universal importance of the dairy, while they moreover indicate those States in which distance from the market and the low price of pasture lands, combine to render grazing the most convenient, as well as the most profitable branch of farming. In the valleys of the West and South, and in some parts of New England and the middle States, beef is raised to a profit—every advantage being taken of the best breed of cattle for such a purpose. On the East and on the West, on the North and on the South, in every direction, at the fountain head of our grain crops, before corn has been quadrupled on the original price of the producer by long transportation, and by speculation, there, where the rich valleys and prairies of the West offer an abundant and a cheap sustenance for cattle, and where a propitious climate economizes food and labor, while all about us beef is growing as it were spontaneously—we can never expect to adopt this as an extensive branch of our farming interest.

It is the dairy therefore which occupies the attention of most of our farmers. Every man who owns land keeps a cow. The milk pail is one of the first utensils provided for carrying on the domestic economy. The rich man is never satisfied until his table is furnished with milk and cream from his own private animal. The poor man finds his establishment incomplete until he has added a shed for his cow ; and his farming is never perfected until he occupies the highway as a pasture, and gleans his winter's store of fodder from the neighboring meadows. Every larger farm has its dairy proportioned to its size and cultivation. As we look abroad over our State, it must be apparent to every intelligent observer, that he will be a true benefactor to our farming community who will improve the dairy stock of New England, and bring it to as high a degree of uniformity as possible, making all due allowance for diversities of climate and locality.

We hear a great deal of the "old red stock of New England." It has many warm admirers; and in the literary devotion of some of its highly intelligent historians and friends, (I had almost said apologists,) it promises to become as classic in the bovine annals, as the "Old Red Sandstone" has become in geological pages, under the pen of Hugh Miller. I suppose there is such a breed of cattle—but what it is and where it originated, I have never found any investigator who could inform me. The first cattle brought into New England, were imported in the Charity, in the care of Mr. Winslow, the Agent of the Plymouth Colony, early in the spring of 1623. To what breed they belonged it is impossible to tell. But as a large proportion of the early immigrants were from Devonshire and the South of England, where the Devon cattle were even then popular, and where that breed had long been established, it is very probable that the earliest arrivals here were strongly tinctured with this blood. It is not very probable that they were of pure blood, for the circumstances of our ancestors did not admit of their entering very largely into fancy stock. It is more likely that the animals were purchased as advantageously as possible in the section of country whence the travellers debarked. The color of their descendants would indicate that they were Devons more or less pure.

There is every reason to suppose that the class of animals to which I am referring had their origin, as I have suggested; and that in the same manner a larger sized and coarser animal was early found in New York, and a smaller and less thrifty breed, analogous to the Jerseys, were planted in the southern parts of Maryland, and are found there to this day.

Whatever may have been its origin, it has really no characteristics left, which would recommend it to an intelligent breeder. The "old red stock of New England" is acclimated it is true—so is the second generation of any imported Shorthorn or Ayrshire or Jersey. But the difficulty is that they are a series of accidents. There is no prevailing type about them. Long-horns and short-horns and no-horns; straight-backs and crooked; shoulders as compact as those of a Suffolk pig, and shoulders as loose and coarse as the fore-quarters of a dromedary; fine, silky hair, and hair as coarse as bristles; the "feel" of an air-tight stove, and skins as soft and elastic as wash-leather; a heap of offal on the one hand and that superabundance of flesh nicknamed "sandwich," on the other; pocket editions of cows and huge folios of oxen growing side by side in the same family; cows that will give milk the year round, and cows that go dry four or five months out of the twelve, both of one parentage; these constitute the "old red cattle of New England," which are recommended to our farmers for their special care and attention. There are meritorious animals among them, it is true. It would be extraordinary were there not. But let any man undertake to collect a herd of twenty cows, of superior quality, out of this great New England family, and how long do you suppose it will take him to do it? As I have said, the good ones are the exceptions—they are fortunate accidents. And although there may be in these animals —some of them—a basis for good native stock of our own, still I must confess that I conceive the farthest remove from them the best position to gain with any prospect of uniformity and superior excellence.

The observation of every man of experience will teach him this. Wherever in New England, or in fact, in the United States, you may find a locality famous for good cattle, the high quality of that stock has come from some pure importation. More than fifty years ago, Mr. John Vaughn, a liberal and intelligent gentleman, who conceived that England without Priestley was no place for a Christian to live in, followed that great philosopher and divine in his flight to our shores, and settled on the banks of the Kennebec. He imported the Durham cattle of that day, the improved Short-horns of ours; and you may find to this day, grazing in the valley of that river, a large, thrifty, quick-growing, solid, massive breed of cattle, the indigenous Short-horns of that region; indigenous, because they have become adapted through generations to that soil and climate, and are now among the most profitable products of the State. Go to Portsmouth and the surrounding towns, and you will find cattle of similar quality and description, the fruits of the more recent importations of Colonel Pierce; a native stock now, but possessing certain characteristics, which they neither lose either in succeeding generations or in various families. An importation into the valley of the Connecticut, by the late Mr. Williams, whose herd has been transmitted with as much judgment and skill and intelligence as can be found even in the old country, has stamped the stock of this section with points of value seldom equalled. I had often been struck with the excellence of the cows in the Aroostook region, and thence to the Bay of Fundy —a well-bred, hardy, dairy-looking race of animals; and I soon discovered that some choice Ayrshires had been brought into that country. The oxen of Meredith Bridge and Lake Winnipisseogee—who has not admired their stately carriage, their rich color, their symmetry of form, their thrift, and their size and endurance? They are the modern Devon blood mixed with Short-horn, and engrafted upon that soil, and brought to a high degree of perfection by judicious care. In an obscure town in Essex County, Massachusetts, there was a remarkable cow, known of all men thereabouts, distinguished from all "the old red stock," for her outline, her milking qualities, her beauty; her owner said she was English; on inquiry, I found that she had descended from a herd of Ayrshires, brought into the country many years ago, and now nearly extinct. There are certain portions of Essex County where I can almost always replenish my herd of cows without much difficulty, and with many chances of finding good animals; and I always find that either Parsons imported into those regions, or such men as Pickering and Newell brought among us choice imported animals from other parts of the State. And I think you will find that whether you are searching for beef or milk, as a general rule, the farther you get from the "old red stock" the better off you will be, always granting that they possess certain qualities which furnish an excellent opportunity for improvement.

I was called to account last winter by one of the religious newspapers of the day, which seemed for the time to have strayed away from that fold to which it was specially devoted, because in the agricultural discussions of the legislative season I had advocated the importation of cattle, and the introduction of the best foreign breeds into our own country, while at the same time I urged the possibility of improving the quality of our horses by confining ourselves to the best breeds which we now have among us. A word in defence and explanation may not be inappropriate here. The picture of our so-called native cattle, which I have drawn, is not inaccurate. Wherever I find a high average of dairy produce per cow, as in Vermont and

Massachusetts, I find also an infusion of foreign blood, brought here, and planted on our soil for the special purpose of establishing a dairy stock. When, on the other hand, I go to Kentucky and admire her herds of beef cattle revelling in the rich blue grass pastures of that State, I find that her farmers availed themselves of the patient and long continued efforts of beef-breeders abroad, as the foundation of their work. In the dairy herds of Vermont may be traced the strains of the Ayrshire and Short-horn blood, which have entered the State from the Scotch farmers on the north, and from the enterprise of Massachusetts on the south. It is by the same process that improvements in our cattle have been made throughout our country. And the reason is this: Having no specific stock of our own, no stock devoted to any special purpose, we have been obliged to look elsewhere for it. Half a century ago it would have been almost impossible to have discovered what the neat stock of New England was intended for, whether for beef, or the dairy, or for the simple purpose of consuming the produce of our farms, or for all these objects combined. The whole system of breeding—in fact, the whole community of our cattle was in utter chaos and confusion, out of which no man considered it possible to bring order. Accidental importations of valuable animals soon began to produce a very marked effect. And observing farmers soon found that size, symmetry, adaptation to any peculiar want or purpose could be obtained by a judicious selection of pure blood. A little herd of Devons, for instance, whose lineage commenced with the early days of agriculture in England, was found to give new vigor and style and increased value to the stock of the neighborhood into which they were imported. A few stray animals from the Channel Islands or the north of France, would leave a new type and a somewhat improved one too, in the region where they happened to land. The marked effect of Durhams, as they were then called, and in later years, of Ayrshires, of Galloways, and Holsteins, and Herefords, was so evident, that even the most careless farmer became anxious to avail himself of the improvement. For he found in the confusion of shapes, and sizes, and colors by which he was surrounded, that "blood will tell," and that an animal intended for a specific purpose possessed qualities and powers unknown to any mere accident. The old-fashioned Yorkshire cow, the great cow of the London dairies, whose immense frame has served as the foundation of a most valuable race of animals in England, did much to increase the dairy products of our farmers, belonging as she did to a race of milkers. And it soon became evident that the most rapid and economical way to arrive at any desirable point, was to begin at once at the fountain head, wherever that had been fixed.

Whoever at the present day desires a dairy herd, can find animals bred for that special purpose, for many generations, on the farms in Ayrshire, and which have been brought by care and cultivation to the highest standard of a milking cow. He cannot find that in this country, he must go abroad for it. So also of animals for beef, work, &c. There are better breeds of cattle in England and Scotland than there are in our own country—with the exception of those imported by us, or descended directly from our importations.

Now, this is not the case with regard to our horses. The American trotting horse is an animal after his own kind, and I venture to say unequalled by any horse on the face of the earth, in all that makes such an animal truly valuable for all kinds of work. It takes true equine genius to make a trotting horse. His mechanism must be as well balanced and as symmetrical as a locomotive. Propelled as he is by one quarter at a time, his progress is the result of nerve, and strength, and decision, unknown and utterly ignored in that leaping, bounding motion, where one end follows the other, as is the case with the running horse of the English turf. He must be solid in his foot, strong in his limb, firm in his back, free and easy in his stride, and above all things, calm and collected amidst all those trials of the track and the road which tend to throw him off his balance, and reduce him to the level of the hare, and the fox, and the grey-hound, and the English race-horse, running helter-skelter in a natural manner, without the exercise of any faculties except those with which nature endows the coward when he flies from danger or conflict. The American trotter requires bones, and muscles, and brains. And when he stands high in the list, he has them all. For compactness of form and ease of motion, for strength, endurance, and sagacity, he is unequalled.

The beautiful description which Virgil gives of a good steed in his day, is just as true in our own:—

> "Choose with like care the courser's generous breed,
> And from his birth, prepare the parent steed;
> His color mark, select the glossy bay,
> And to the white or dun, prefer the gray.
> As yet a colt he stalks with lofty pace,
> And balances his limbs with flexile grace:
> First leads the way, the threat'ning torrent braves,
> And dares the unknown arch that spans the waves.
> Light on his airy crest his slender head—
> His body short, his loins luxuriant spread;
> Muscle on muscle knots his brawny breast,
> No fear alarms him, nor vain shouts molest.
> O'er his right shoulder, floating full and fair,
> Sweeps his thick mane, and spreads its pomp of hair;
> Swift works his double spine, and earth around
> Rings to his solid hoof that wears the ground."

Now we have this animal as the natural product of our farms. I know not how it has come to pass—but it is a fact, that the farmer's horse in New England is peculiar to himself, and is, moreover, peculiarly an American institution. He may be descended from the Thoroughbred, for any thing that can be said to the contrary; but the farther he is removed from that rather equivocal class of animals, the more truly does he become a trotter. I look upon him as one result of that social and civil equality which in our own country makes one man's time as valuable as another's, and which authorizes the farmer's boy to take the road from the squire, or the parson, or the doctor, whenever his colt can do it. Every man in this country who can keep a horse, wants a good one, and when he has got him, he wants to avail himself of his horse's powers, to make the distance between the mill or the meeting-house and his own home as short as possible. We all drive on the road; and this, combined undoubtedly with certain fortunate aptitudes of climate and soil, has given New England her valuable race of trotters.

Why should we go abroad, then, with the expectation of improving what we now have? While we have our Messengers and Black Hawks, and other families of Morgans, so diverse in size and shape, so well fitted by form and temper to every labor, and yet possessing a kind of prevailing uniformity expressed by the phrase, "a horse of all work," can we hope to derive any benefit from a resort to those specific breeds of horses which in England are devoted each to its speciality? There is no necessity, for instance, for importing a Suffolk Punch—for half a day's search would undoubtedly provide you with just such an animal, raised on your own soil. We need not import hunters, for we have no need of any such horse among us. The Cleveland Bay, valuable as a carriage horse, could hardly expect to improve the stylish breeds found South and West, and distinguished more for style than any thing else. And when we consider that it is only after we have reached many removes from the Thoroughbred, that we have arrived at good trotters; when we remember that neither in shoulder, nor leg, nor quarter, nor general mechanism, is there any analogy between the Thoroughbred as raised in England, and the trotter as raised in our own country, we may well ask ourselves what advantage is to be derived from the introduction of such animals among us.

It is because we have already what we want in the way of horses, that I am opposed to the introduction of foreign blood among them. Our customs and modes of life, together with perhaps a fortunate outset, and certain natural advantages, have produced for us better horses than we can import. If this were the case in regard to our cattle, I should entertain the same opinion with regard to them. But it is not so. We have, partly by accident, and partly by design, been engaged for years in developing a race of trotting horses. But we have not developed races of cattle, peculiarly adapted to the dairy or the shambles. That work is still before us; and we can only accomplish it by obtaining such animals, wherever they can be found, until we have established the races for ourselves.

With this estimate of the value and importance of the various breeds of cattle in England, and the advantage to be derived from their introduction into this country, I am aware that some discussion of their respective merits will be expected of me. There are certain qualities belonging to each of them which present strong temptations to the farmer; and it is, moreover, undoubtedly true, that certain modifications take place in all, after their introduction to this country, which may be good or bad, according to the quality of the importation, and the influences to which it is exposed. Senator Douglas once told me that Illinois was producing better Short-horns than could be found in England; and I have no doubt the breed does improve on the fine pastures and under the mild sky of the West and South-west. Thoroughbred Devons seem never to have maintained in this country the character they have secured in England. Both as cows and oxen, they are graded here to great advantage, but as pure animals they seem to degenerate. I have never seen so good a Jersey cow raised in this country as I have seen imported. Of Herefords, West Highlanders, and others, we have hardly had good opportunities to judge—the former not having increased to any number, and the latter hardly having appeared among us. Ayrshires, judiciously selected and properly treated, have taken kindly to our soil and climate, and in many instances have improved upon the originals.

So far as the products of the various breeds of cattle are concerned, there are certain facts worthy of notice. There is no doubt that the beef of the West Highlander, of the Devon, and perhaps of the Galloway and Hereford, is better than that of the Short-horns—not so profitably raised—but more palatable. I found no beef in England, where roast beef appears as it does in our own country, so good as I find in the markets of New England, and especially in those of New York, Philadelphia, and Washington. So far as my observation goes, and so far as I can learn from dairymen abroad, cows go dry, on an average, twice as long in this country as they do in Great Britain and other parts of Europe. These various facts are worth remembering, while we discuss the quality of different breeds of cattle, whether for beef or milk.

It having been determined by the English farmer, that the production of beef and milk cannot be profitably combined in the same animal, the chief attention of breeders there has been turned to what might be called a division of the question. Agriculture in England is conducted in such a manner as to render it remunerative to the farmer, as well as useful to the great mass of consumers; and the raising of beef and mutton has become a very important and well-regulated branch of husbandry. Not only have systems of economical feeding been adopted, but great attention has been paid to the production of animals best adapted to growth and early fattening. For many years the Herefords and Devons stood in the front rank, in all beef-growing districts. But it was found, as was supposed, that the Hereford was unfit for the grazier until after he was two years old, and that although he took no fat readily after that period, still he was hardly a remunerative animal to rear up to that age, and the profit to be made on him came not to the grower, but to the feeder who purchased him for stalling or grazing. The same fault was found with the Devons, which, as ox labor was superseded very much by horses, became in less demand for draught, and were found, in the end, although fattening rapidly after reaching maturity, to have cost more than rapid growers and early fatteners. It was these considerations which induced Charles and Robert Colling to select from various herds of the superior animals found in the valley of the Tees, a choice few from which they succeeded in creating the famous Improved Short-horn, which has probably already gained the highest position among English beef cattle.

From the time of the sale of Charles Colling's herd, October 11, 1810, up to this time, the breed has continued to rise in public estimation, and the fabulous prices secured for the animals, both in England and in this country, indicate a high reputation, whether deserved or not. There seems to be no doubt that they are a very profitable animal to raise in certain sections, reaching early maturity, taking on fat during the whole period of growth, and attaining great size. So far as our observation goes, they make very superior grades, and unless allowed to degenerate by scanty feeding and improper care, in which case they become raw, misshapen brutes, they are a valuable acquisition to almost any district. They have their defects, however, as what races have not? Short-horn beef, although profitable to the producer, is not so to the consumer—being coarse in texture, poorly marbled, and from its early maturity deficient in those nitrogenous compounds which are the true sources of nutriment. This is not true to so great an extent of the grades as of the Thoroughbreds; and while I have no doubt that pure-bred Herefords or Devons would be more profitable for the New England farmer, whose mode of feeding is not calculated to produce early maturity, I find many judicious farmers who believe that an admixture of Short-horn blood, properly distributed, is of greater real profit than the same use of either of the others. I have seen, moreover, grade Short-horn cows in New York and some sections of Massachusetts, whose milking properties are extraordinary, notwithstanding the universally acknowledged fact that pure-bred Improved Short-horns lay no claim to being considered dairy animals.

I do not mean to say that these remarks will apply to every section of our country. You will however sustain me in applying them to many sections; and I am supported in my position by the testimony of many intelligent farmers. One thing however, I do find universally acknowledged, viz.: that Short-horns, pure and grades, require an abundant supply of nutritious food and careful shelter and shade. It must be said of them that they are not universally applicable, and that as an animal for the small farmer, they are hardly appropriate. I find the same view taken of them in some parts of England, as in the county of Shropshire for instance, where Herefords of every description are decidedly preferred—not as I can learn for the dairy at all, in any form either pure or grades—but for easy feeding and rapid fattening, after reaching maturity.

I have dwelt upon Short-horns as the foundation of a grade stock for some portions of our country, because they have attracted more attention than either Herefords or Devons—because they have imparted, from their size and show, more striking characteristics to our cattle than either of the other breeds—and because they have attained so high a celebrity in their native country. They have moreover a strain of milking blood in their veins, which has shown itself in grades, with great advantage to the dairy. Perhaps the same can be said, indeed, of Herefords or Devons, the latter of which have been extensively tried, and the former of which, for their hardiness, shape, size and thrift, deserve more consideration than they have yet received. It seems to me that for all our various localities they possess a degree of applicability, which might be very valuable to us. Short-horns must be fed from the start. Herefords can be kept low until two years old and then fattened. Perhaps I might say that Short-horns are better adapted to the mild climate and rich pastures of our middle States, and Herefords and Devons to more northern latitudes, where early growth is often unavoidably checked.

But as I have stated, observation and statistics show that the dairy is one of the most important objects of the cattle breeder, and that it is to the dairy that we are to look for our largest profits. In this class of animals, the Jerseys have become too well known in Massachusetts to need much comment. They were described by Parkinson, a distinguished English writer on cattle, in 1810, under the name of Alderney, as follows:—

"They seem to be a very tender species. Their color is mostly yellow, with white or mottled faces, and white interspersed on various parts; they have short, crumpled horns; their size is small, and they are of as bad a form as can possibly be described; the neck is very thin and hollow; the shoulder stands up, and is the highest part; hollow and narrow behind the shoulders; the chine is nearly without flesh; the hucks are narrow, and sharp at the ends; the rump is short; the thighs are thin; the bones are small; and they are narrow and light in the brisket; the milk is said to be rich, which it ought, as they give but a small quantity, according to the food they consume."

This description will apply to many of the Jersey cows of the present day—although the form of some families of them seems to have been much improved within the last few years. They are now in many respects, when well selected, striking looking animals, and make a beautiful living ornament to parks and meadows. They are almost strictly gentlemen's cows, having obtained a high reputation for butter making, and being great consumers of food. Few imported animals present such remarkable differences—many of them bearing a close analogy to the description given by Parkinson, and others being symmetrical, uniform, compact, graceful, rotund, and as remarkable for the small quantity of milk they yield, as for the beauty of their persons. There are, however, exceptions to both these rules—and I would instance Flora and Countess, imported by the Massachusetts Society for Promoting Agriculture, and a cow imported by Charles G. Loring, Esq., of Boston, Mass., as a specimen of what a cow should be in shape and capacity. There are few Jerseys like them.

Jerseys never look well under ordinary circumstances. They require good food, good shelter, a good looking stable, and cleanliness to bring out their attractive appearance. The grades, so far as my observation goes, are very fair milkers, but not very remarkable; and I doubt if in any form they will ever become favorite animals with our farmers.

Whoever proposes to purchase the Thoroughbreds cannot be too careful in his selection—for the difference between the genuine, well-bred and well-shaped Jersey, and the spurious animal which comes from any of the Channel Islands or the north of France, and is driven by dealers through the principal markets of England for sale or barter, is as great as can be conceived between any two animals.

The dairy-farming, which is especially a part of the business of the farmer, in the eastern States, finds its analogy, not in Yorkshire, nor in the Isle of Jersey, but in that portion of Scotland where the soil and climate are more like our own, and where the development of dairy-stock has received the attention of some of the most intelligent men of the community. The farmers of Ayrshire and Wigtonshire find in their immediate neighborhood a market for fresh dairy products, and as there is no profit in feeding cattle for beef alone, in that region, they have applied themselves to the work of obtaining the best dairy cow, that can be put together. This is the origin of the breed of cattle called Ayrshire. They are comparatively modern in their introduction into the list of breeds, not having been mentioned at all by Parkinson, fifty years ago; and being derived, as many assert, from a mixture of Short-horn blood with the native blood of the region. We know herds which have been forty years at least in being brought to their present condition.

These animals are the model of a dairy cow. Hardy, well-shaped, of medium size, and giving ample return for the amount of food which they consume, they are wonderfully adapted to our short pastures, and to our long, cold winters. Without presenting any uncommon peculiarity, excepting a remarkable symmetry, they would be selected at once by one of our intelligent dairymen as the pattern of a cow suited to his purposes. They are very analogous to our American trotting horse, in all those points which unite to make a superior animal. In their deep bodies, strong, clean heads, well-set, fine, and at the same time muscular necks, sharp withers, sloping, prominent, well-set shoulders, straight backs, broad hips, long quarters, and fine, but not too small, bone ; in their size, neither small nor large, they possess all the points, as you will see, of our best native horse—a resemblance which will be found to a remarkable degree, whenever you find a really good cow.

For the gratification of those who are exact in such matters, I will give the measurement of a four-year-old cow which I imported from Scotland last year, and which had received there a succession of first prizes as the best model of a cow raised in that country.

Girth, 6 feet. From the top of the shoulder to the tail, 4 feet, 6 inches. From the hip or hook bone to the point of the hip, 1 foot, 7 inches. From the point of the brisket to the rear of the udder, 4 feet, 6 inches. Length of udder, 1 foot, 6 inches. Distance from udder to brisket, 1 foot, 10 inches. Distance between the teats from front to rear, 4 inches ; from side to side, 2½ inches. Height, 4 feet, 2 inches. Width across the hip, 1 foot, 9 inches. Width across the back, 1 foot, 5 inches. Length from the elbow to the point of the shoulder, 1 foot, 2 inches. Length of fore-leg, 2 feet, 2 inches. Length of neck, 1 foot, 11 inches.

In form she is as well balanced and symmetrical as an animal can be constructed. Her back is a perfect level ; and with the perpendicular bearing of her limbs, and her evident strength, a superficial observer would say at once she was admirably constructed to bear the wear and tear of a dairy farm or a milk farm, a sphere of life as trying to a race of cows as a livery stable or a truck is to the race of horses. No feeble animal can endure it.

The cow to which I refer, commenced her operations by giving twenty quarts of milk per day, at three years old.

I consider the Ayrshire cow as the universal cow for the dairy. She makes beef enough, when properly reared and fed. She yields an abundance of milk for cheese or the market; and stands high as a producer of butter.

Among them is a race of animals partaking strongly of the nature of the Short-horns, round, compact, thick-meated, close-shouldered, easily fattening, which are to be avoided. Some are found also with a peculiar shelliness of skin, a hard, unyielding inelastic feel, which is very objectionable. Avoiding these two defects, you can hardly fail of purchasing a good cow, taking the average as they appear on the farms in Ayrshire.

The oxen of this breed are remarkable for activity and vigor, and for great thrift when fed for the shambles.

WHY A MASSACHUSETTS FARMER SHOULD BE CONTENT.

From an Address before the Norfolk Agricultural Society.

BY GEORGE S. HILLARD.

I propose to occupy your attention with a statement of some of the reasons which should make a Massachusetts farmer contented with his lot. I would fain induce the farmers of Massachusetts to plant and cultivate the herb called Heart's-ease, which the shepherd boy whom Christiana and Mr. Great Heart saw in the Valley of Humiliation, carried in his bosom. It is a wholesome herb, and its breath is sweeter than violets, and I do not think it grows in New England gardens so generally as it should do. I hold it to be a good work to strive to make men contented with their lot. Godliness with contentment, says the apostle, is great gain. Observe how the two things are joined—godliness with contentment. Godliness without contentment may be gain; but it is not great gain, at least, not the greatest. The goodness which is sour, ungracious, and repining,—which has no effusions of gratitude to God, or kindliness to man—is a poor and imperfect thing; it is heat without light, like the warmth of a conservatory; but godliness with contentment is like God's blessed sunshine, at once warmth and light.

Every human being is the centre of many circles. Some of these embrace all the relations of humanity: some comprehend those of country and political society; and others are limited to the particular calling by which one's bread is earned. Every farmer in Massachusetts is first, a man; second, a citizen, and last, a farmer. But I shall eliminate all the elements and considerations except those which belong to the innermost circle, and shall confine myself to those points which touch the farming population of Massachusetts, and do not go beyond them.

Still the condition of the farmer himself—the desirableness or undesirableness of his position—is dependent, in some measure, upon elements which operate upon other callings as well as his own; but I shall treat of these elements only as they directly or indirectly affect him.

An obvious division of my subject is suggested by considering the answer to these two questions: What is the relation of man to the land? What is the relation of man to the soil?

By land, I mean landed property, or real estate; and by soil, I mean that portion of the crust of the earth from which all forms of vegetable life derive such part of their growth as is not drawn from the atmosphere. Man's relation to the soil is substantially determined by natural and irreversible laws, and can only be modified by labor or capital. Man's relation to the land is regulated by usage and custom, taking the form of positive law.

Let us first consider what are the relations of the farmer to the soil in Massachusetts; in other words, what are the natural advantages and disadvantages attendant upon practical agriculture here. The soil of Massachusetts shares in the general characteristics of the soil of New England. New England is a primary region, in the nomenclature of geology; and its soil is the disintegration and decomposition of the primary, or crystalline, rocks. It is for the most part light and thin; frequently running into sand and gravel; and, except in certain favored spots, as in the Valley of the Connecticut, of only moderate fertility. A larger proportion of it is more suitable for grazing than for arable tillage. But if our soil be not of that great fertility which invites capital, and tempts to minute subdivision, little or none of it is of that hopeless barrenness which discourages labor. It is a soil which stimulates industry, and reasonably rewards it; and who has a right to ask more than this?

The climate of New England, though often abused, is not a bad climate on the whole. We have long winters and hot summers; but the air of winter is pure and bracing, and the heat of our short summers is rarely so great as to interrupt labor, or make it dangerous to health. Such degree of solar heat as we have in New England, is not only not injurious to health, but I believe beneficial to it. When we are summing up the good and the bad of our climate, we must bear in mind that it is to the heat of our summers we owe the variety and fine flavor of our fruits, in which we excel the English as much as they excel us in scientific farming. From the heat of our summers, too, comes our Indian corn, by far the most important agricultural production of this country; the value of which slightly exceeds the aggregate of the three great staples of wheat, cotton, and hay.

The climate of New England, though often disrespectfully spoken of, is not unfavorable to health and longevity in those who, in their way of living, observe the laws and conditions of health. We are apt to make the climate a sort of scape-goat for sins which really lie at our own door. The general standard of health here is not so high as it might be, and ought to be; but this is not the climate's fault. Nor is it because we work too hard. Men do not work any harder here than they do in Great Britain, either in the learned professions, or the active employments of business. The truth is that men never are killed by work, but they are sometimes by worry. In New England there are many men and many women whose lives are shortened, and whose vital force is diminished while they do live, by moral causes; by the corrosion of disappointed aspirations, by the failure of unreasonable and fantastic hopes, by the shrinking of ill-woven ambitions, by feverish longings for those glittering prizes of life which very few can hope to win, and by a rebellious chafing against the will of God, when their lot is poverty, obscurity, and failure. And there is another source of ill-health in New England, which stands at a point in the circle of humanity directly opposite to that which I have just been considering, and that is the prevalence of bad cookery, and the amount of unwholesome food which is consequently consumed. It is doubtless mortifying to the pride of humanity to be obliged to confess that the grandest energies of the will, and the finest operations of the understanding, are dependant upon the way in which we treat that vulgar organ, the stomach; but the sooner we admit the truth, and act upon it, the better it will be for us. I am persuaded that the food served habitually upon a majority of the tables of New England, is such as the rules of dietetics would pronounce to be unhealthy; and that if the farmers of New England, should, in the feeding of their stock, neglect the laws of nutrition and assimilation, as much as they do in the rearing of their families, they would be pronounced ignorant of their profession. New England is a region swarming with sensitive and uneasy consciences: the spirit of reform is restless, clamorous and importunate: it busies itself with distant toils and inaccessible wrongs; but here is a grievance lying at our very doors, to which this spirit may be legitimately and profitably addressed. Reform your kitchens; reform your gridirons and frying pans, and you will be surprised to find how much your climate will be improved.

There is a law of compensation which runs through all things; and it applies with peculiar force to this geological structure of New England, which denies to us any considerable extent of very fertile soil. We owe to this our fortunate exemption from those intermittent fevers which are such a scourge in other parts of our country; and are commonly produced whenever low, marshy lands are exposed to the action of the sun's rays. Fertility and disease are often found dwelling on the same spot; and we may be content to give up something of the former if we are spared the latter.

There are other advantages arising from the structure and natural features of New England which come directly home to the business and pocket of the Massachusetts farmer. We have deep water along our coasts: we have a bold and rocky shore, opening into bays, estuaries, and inlets, in which safe and sheltered harbors abound; and we have a great number of rivers and streams which in their passage from their sources to the sea, are constantly passing from a higher to a lower level: and lastly, the seas which wash our coasts abound with the fish which are the most valuable for food, and thus the most important as articles of commerce. Hence our natural advantages for commerce and manufactures; the latter arising from the great abundance of water-power which the downward flow of our streams creates. Nor should we, in summing up the gifts of a kind Providence to us, overlook our immense forests, which not only so much embellish our landscape, but are of such value in their application to the wants of man, and the arts of life.

The result of these natural advantages is seen in that diversity of employment which is one of the marked characteristics of New England society, and by which none profit more than our farmers. How greatly the agriculture of Massachusetts has been stimulated and improved by the commercial cities along our coast, and by the manufacturing towns which, within a few years, have grown up on the banks of our innavigable streams—innavigable because of those breaks and falls which make them available for manufacturing purposes! Towns like Lowell and Lawrence enhance the value of every farm in their neighborhood, and stimulate the industry of every farmer. And they do this in two ways: first, they furnish to the farmer a new market for the produce of his farm, and thus diminish the cost of transportation, which is the farmer's great difficulty everywhere. It is a difficulty inherent in his occupation, because the products of the farm are always and everywhere bulky. Here is a man with five dollars in his pocket, who wants a barrel of flour, and there is a man with a barrel of flour, who wants five dollars; but the two are five hundred miles apart. In vain do they stretch their hands across the waste and exclaim: "Ye gods, annihilate time and space, and make two lovers happy." A city like Lowell, suddenly and rapidly starting up in the midst of an agricultural region, does annihilate time and space, to all practical purposes. And in the second place, these aggregations of population furnish, or may furnish, to the contiguous farms, their appropriate nutriment in the shape of manure. Manure is the food of the farm; and if the resources of our cities and large towns in this regard be not fully employed, it is because farming has not reached the degree of excellence which it might. And there is still another advantage secured to the farmer by the proximity of these large towns. They create a demand for fruit and garden vegetables, and thus enable the farmer to vary his productions, and diversify the somewhat monotonous toils of agriculture with the lighter labors of horticulture.

We see also in the land of our fathers, from which our agriculture, as well as our laws and our speech were derived, an illustration of the benefits which agriculture has enjoyed from the diversity of employments open to its people. The excellence which British agriculture has reached is due in a considerable degree to the dense population of the British isles, and the number of local markets which have been thus created; and this dense population is due to the great natural resources of the country, and the judicious policy by which they have been fostered and developed. The coast of England abounds in harbors, and its considerable rivers are not interrupted by breaks and falls; and are thus navigable for a long distance from their mouths. This characteristic of their rivers denies them the abundant water-power which we possess; but this want is compensated by the boundless steam-power which their coal mines furnish. England presents the remarkable and anomalous spectacle of a nation in which less than one-sixth of the population are engaged in producing food for the other five-sixths. The brilliant results of British agriculture, and the progress it has made since 1815, are owing to this disproportion, and to the wealth which commerce and manufactures have been pouring into their lap. Every man in England who acquires wealth in commerce or manufactures, invests more or less of it in land; and amuses himself with the expensive luxury of gentleman farming. Mr. Mechi, one of the best farmers in England, and one of the best writers on agricultural subjects, is a tradesman in London, carrying on a large business. The profits he derives from his business he invests in a farm, which it is his pride to make a model establishment in every respect. Every thing that money can buy is bought, and every thing that knowledge can do, is done, to further this object. No matter how expensive an experiment may be, he is ready to try it if it gives a fair promise of success. Nor is he by any means a solitary or exceptional case.

The Massachusetts farmer has yet another advantage, in which his English brother shares with him. I refer to the railroads by which the State is veined and arteried, and by which so healthy a circulation is kept up between producers and consumers. These railroads are a pure and unqualified benefit to the farmer. They have been built, for the most part, by capital accumulated in trade or manufactures. The beneficial influences of railroads are twofold. They save time and money in the transport of the products of farms, live stock included; and enable the farmer to make use of distant markets. This is a direct and tangible benefit, the extent of which may be calculated in dollars and cents. But they serve the agricultural interest in another way. They enable men to do business in Boston, and live in the country. ten, fifteen, even twenty miles off. This is an advantage to him, we readily see. It purifies and elevates his life, by the daily influence of rural sights and sounds. The freshness and beauty of Nature, glittering with morning dew, prepare him for his daily toils; and when these are over, he is soothed and refreshed by the sweet influences of sunset and evening. It is an advantage for his children; for they are saved from the dangers of city life; they gain health and strength from pure air, regular habits, and invigorating exercise; and they learn a thousand useful things that books and schools cannot teach. But this is not all.

No man will be willing to take two journeys in the cars, every secular day of his life, unless he is fond of the country; and this is but another way of saying that he is fond of farming or gardening. He buys land, enough for a garden, if not a farm; he builds a house as tasteful and convenient as his means will allow; and to the decoration and improvement of his place he devotes his leisure time, and a reasonable proportion of the earnings of his business. This new demand for these surburban retreats causes the price of land to go up with balloon-like rapidity. Many a farmer wakes up some morning and finds himself rich, because his farm may be profitably cut up into house-lots. In the meantime, the energetic merchant or trader carries on his farm, or cultivates his garden, with the vigor and enterprise which he puts into his business; and having the advantage of capital, derived from other sources than the land itself, the union of the two soon begins to tell. His barns will be the largest and the best arranged; his cattle the sleekest and finest; his fences the neatest; his garden the trimmest. His Alderney heifers, his Suffolk pigs, his Bartlett pears, his Baldwin apples, will take prizes at agricultural fairs. The primitive farmer,—native to the soil,—whose father and grandfather were farmers before him,—begins with looking with distrust upon his cockney neighbor. He shakes his head at his improved implements, his mineral manures, his scientific farming; he predicts that he will never see his money back again; but as the seasons go on, and the returns vindicate the judiciousness of the new methods, he ceases to disparage and begins to imitate. His somewhat torpid energies are quickened and animated by the wholesome example that is set him; his own farm and garden begin to improve, to be more carefully tilled, and to yield better returns. This process, slowly and quietly going on in hundreds and thousands of places at the same time, begins at length to produce changes in the landscape itself. I, whose memory goes back many years before the first railroad was built, never go out of Boston, in any direction, without being struck with the improvement which has taken place in domestic architecture, in horticulture, in landscape gardening, since I was a boy,—without being impressed with the signs of comfort, intelligence and good taste which diffuse over the landscape a sort of moral charm, because they are the indications of valuable traits of mind and attractive qualities of character. Though a conservative, so called, in politics, I believe in progress; I acknowledge it and rejoice in it. I see that we have made progress, and are making it, in many things. I am happy that my lot is cast in a progressive land, and that the sunshine of hope lies bright upon the future that is before us. In material comforts, in the arts of life, in the means and instruments of education, in the graces and refinements of civilization, the advances which New England has made during the last half century, are most remarkable. Who can deny it? Who can fail to be thankful for it?

I have just now briefly touched upon the benefits which agriculture has derived from the growth of commerce and manufactures in Massachusetts. This is one department of a subject which has to me a peculiar interest; I mean those common relations and that mutual dependence, which bind together all the members of a civil society which is organized upon a just principle, as ours is. We are all God's children; and He is a just as well as a benevolent parent. Whatever benefits one, benefits all; whatever advances one, advances all. When sudden changes occur, it may take some little time to adjust things to their new relations; but with time all things come round at last. When railroads began to be built, it was supposed that the demand for horses would be greatly diminished; but what has been the result? More horses are employed in carrying passengers to and from the railway stations than were formerly required for all the stage coaches in New England. So some persons fear that that blessed invention, the sewing-machine, will throw many poor women out of employment; it may do so for a short time, but, in the long run, more women will earn their bread by sewing-machines than now do by the needle, and with far less waste of health and strength. Nothing can be more false than the notion, that the interests of one class are opposed to those of another, or that there is any antagonism between capital and labor, or between the city and the country; and nothing can be more ungracious than the conduct of the man who attempts to set strife between different portions of the same community, or to persuade this man, or this body of men, that somebody else is growing rich at his or their expense, and appropriating what belongs to them.

I have thus far spoken of the relation of man to the soil in New England, and endeavored to extract from that the motive and the cue for contentment. I now proceed to speak of the relation of man to the land; a comprehensive and fruitful theme, on which, however, I can dwell for only a very few minutes. In every part of Christendom the traveller sees men laboring in the fields in spring, summer and autumn. It is the same thing to outward sense everywhere, in Great Britain, France, Italy and America. It is the man and the earth. But the moral, the immaterial, the intangible elements differ very widely; and half the problems in civil society are solved by an examination into the relations which exist between the man and the land. In the first place, does he own the land which he tills, or is he only a hired laborer? Secondly, if he owns the land, under what conditions does he own it?

In England, as is well known, the land is parcelled out into very large estates. The number of acres in England is 32,342,400; the number of landed proprietors is about 44,000; which would make the average size of estates about 735 acres. In Scotland they are larger still. The number of acres is 19,738,930, and the number of proprietors is not more than 5,000; which would give each one nearly 4,000 acres. Five noblemen own about one-fourth of Scotland. The land is usually let in large farms, on long leases, to tenants; and is cultivated by laborers who earn from twelve to fourteen shillings a week, and a little more at harvest time. The public sentiment of England encourages this aggregation of landed property, and the law allows it. In France, on the other hand, the law enacts, and public sentiment sanctions, a minute subdivision of land; and the result is, that full two-thirds of the whole French people are land owners; the average amount to each person not exceeding thirteen acres.

The comparative advantages of these two systems form a frequent subject of discussion between the political economists of France and England. These discussions are limited to a consideration of the productiveness of the land merely, regarded as a source, or instrument, of wealth. But this does not meet all the elements of the case. Political economy does not and cannot settle all the questions of social and political life. The amount of wealth you can draw from the land is one thing; then comes the proportion in which it is distributed; and, lastly, and not the least important, is the effect of the mode of holding, and the mode of cultivation, upon the cultivator himself. Man is a more important product than cattle, or corn, or turnips. That system of tillage is defective, whatever may be its material results in the production of food, which degrades the farmer himself. A large English estate, in the hands of its proprietor, or let on a long lease to a wealthy tenant,—to which all the resources of capital and all the discoveries of science are applied,—produces wonderful crops and splendid stock; but when you look at the laborer, by whose hands all the work is done, you will see at what cost these splendid results are purchased. You see the thews and sinews of a man, but little of that which makes man "the beauty of the world, the paragon of animals." His form is bent by wasting and crushing toil; neither the gleam of intelligence nor the light of hope illumines his countenance; his life is a constant and often a losing struggle for mere subsistence; for him there is no future. During my visit to England, last summer, I visited a pauper insane asylum in the county of Sussex, an agricultural county in the south of England. I asked the superintendent what was the most prevalent cause of insanity among his patients. After reflecting a few moments, he replied he did not think there was any one more common than mere want. There was something to me very touching in this simple statement. Nothing can be less sensitive and less impressible than the mind of an English laborer; and yet, under the pressure of hopeless poverty that mind sometimes gives way. The cure in such cases is simply rest, and a sufficient supply of nutritious food.

The minute subdivision of land in France has had a most important influence upon the political history of that country, and an influence by no means salutary. The illustrious Niebuhr, who died in 1831, said: "What can be the end of the French system of infinite divisibility of the soil, except general poverty, a struggle between anarchy and despotism, and the final triumph of that military tyranny of which the Empire exhibited the frightful perfection." We have lived to see this remarkable prediction come to pass. This great historian and hardly less great statesman would have found his ideal Commonwealth upon the soil of Massachusetts. His leading political ideas were municipal liberty and self-government, and an independent yeomanry, owning the soil they cultivate.

The relation between man and the soil, in Massachusetts, is at that happy point which best combines agricultural productiveness, with political security and stability. Here men own the farms which they cultivate, and the farms are of moderate extent, averaging about a hundred acres, though as a portion of the majority of farms is woodland, the amount actually under cultivation is somewhat less. The division of our territory into farms of this extent, has come naturally, we hardly know how. It is the growth of the sound, practical sense of New England, unaided by legislation. The diversity of employments among us, of which I have before spoken, and the attractions presented by the fertile fields of the West, have helped to arrest the process of subdivision, and prevented its going below a certain point. Our farms are large enough for these plans of progressive improvement which give dignity to agriculture, involving the application of knowledge and the expenditure of capital; and yet small enough to leave a personal relation between the farmer and the land he tills. Material benefits are not purchased at moral cost. The great proprietor, who owns a landscape—whose principality is tilled for him by a little army of laborers—has his affections dissipated by the very extent of his possessions. The farmers of Massachusetts form a class, the value and importance of which are hardly felt till they have ceased to exist. In some countries of Europe they have ceased to exist; and their extinction is regretted by sound political thinkers as a misfortune. They form the basis on which the fabric of social order may be most securely reared. The spirit of radicalism may erect its menacing crest in our cities and large towns, demagogues may be loud and voluble wherever crowds can gather to hear them, but so long as the soil of Massachusetts is occupied by small proprietors, cultivating the lands they own, we have a conservative element in our society which may quiet the most uneasy alarmist. They keep the ship in trim; and though she may take a lurch now and then, she will not go over.

And now I have done all that I proposed to do. I have presented some considerations which should make the farmers of Massachusetts contented with their lot. Starting with the admission that the soil is not of remarkable and exuberant fertility, I have endeavored to illustrate that great law of compensation which runs through the whole scheme of Divine Providence, by showing that the causes which make the soil what it is, give us other natural advantages not otherwise to be had, so that what is lost in one way is gained in another. And so far as man's relation to the land is concerned, I have shown—and it is an obvious truth—that the position of the Massachusetts farmer is one of peculiar dignity and desirableness: I mean peculiar, in comparison with the whole civilized world. His brethren of the rest of New England, and of the whole Northern States, generally, share with him in this advantage. And the moral I would draw from my discourse—the improvement, as an old-fashioned minister would call it—is this: let the young man who has resolved to become a farmer, also resolve to stay at home. He will hear wonderful stories of the boundless fertility of the West: how the wind of the level prairie waves the deep-bosomed grain for hundreds and thousands of acres, and the yellow harvest runs up to the blue line of the sky; but let him hear it unmoved. They have no mountains: they have no sea: the two grand voices of Nature are silent there. Those corn-bearing plains are the prose of earth and not its poetry; and the imagination languishes and dies amid those wastes of fertility. From the barren mountains and the unfurrowed sea, the soul and the mind of man draw their divinest nutriment. Health, too, will surely be your portion here, and may not be there. The soil of New England hides no fatal poison in its bosom: here "the sun shall not smite thee by day, nor the moon by night." All the blessings of civil society are enjoyed here in as large a measure, to say the least, as any where on earth. Go where you will, you will be in danger of losing more than you find. Here are schools, and books, and cultivated men and women: here are the meeting-house, the lyceum, the town meeting, the cattle show: here are good laws and good roads, the spirit of order and the spirit of progress: here is a noble past and an inspiriting future. Here fix your home: here plant your affections: here let life's sun and shade ripen you.

FARMS.

ESSEX.

Report of the Committee on Farms.

No entries of farms for premiums, have been made during the past year, notwithstanding the liberal reward offered by the society. Perhaps it ought hardly to be expected that any pecuniary consideration within the means of our association, would afford a sufficient remuneration for the trouble and time necessary to prepare a suitable account of the business of any one farm in our county, for the period of twelve months. The manual labor of agriculture is exhausting. The various duties of the active and industrious farmer are intricate and absorbing. The ever changing variety in the results of agricultural operations from year to year; the surprises which occur, under the hidden influences of nature, an abundant crop here, a scanty one there, produced by causes beyond man's reach—the disappointments which often follow well-directed industry, the accidents of weather, the uncertainties of all animal and vegetable productions—all combine, we are aware, to discourage the faithful farmer in his attempts to record the efforts and designs, and results of the year. We can perhaps hardly expect to induce our farmers to make such a record, by any pecuniary reward, which we can offer.

But then there are other motives which should not be forgotten. The first necessity in every successful operation, is a systematic arrangement of our affairs. It is so in trade, in manufactures, in commerce; and from this law agriculture is not exempt. There is a great deal of tradition, it is true, in farming. The son remembers his father's mode of tilling the earth, and has inherited perhaps his father's skill in the care of animals, and he may be a good farmer. But when he would go beyond this, he must turn to the recorded operations of others; and when he would know exactly how he is progressing himself, he must find in his own diary and account books, the history of what he has done from day to day, and from year to year. It is this systematic management, which develops the resources of his farm, by making it a matter of care and study—something more than the theatre of tedious and reluctant daily toil. And although success often comes without it, and failure sometimes comes without it, still it is one of those means which will stimulate the farmer to new exertion, and will tend to have a great influence in all his efforts towards prosperity. It is well to *know* what a crop costs. It is well to *know* what method produced the best crop. It is well to *know* what crop is most profitable in every locality. It is well to *know* how much the farm returns each year. It is well to *know* what animals can be profitably reared and fed. And all this cannot be *known* without a faithful and systematic record; with it, it can be. And this valuable knowledge is one of the rewards which the daily record brings to him who makes it.

Of the value of this knowledge to others, it seems hardly necessary to speak. It constitutes the most valuable literature of agriculture. The theories and speculations of ingenious thinkers have their attractions, and they may possibly lead to good practical results; but he who lays before us an actual operation in drainage, he who gives us the results of various modes of ploughing, he who teaches us from experience the best method of fertilization, he who records the processes by which his farm has risen from a wilderness into all the luxuriance and profit of successful agriculture, does more for his fellow-laborer on the land, than all the theorists combined can ever hope to do. He contributes genuine wealth to the community in which he lives. He enrolls himself with the Smiths, and Youngs, and Mechis, and Tulls—the teachers and guides of agricultural labor. He affords that light which will alone guide us through the dark places of farming, and protect us against those temptations which in the shape of new inventions, and condensed fertilizers, and recently discovered crops of abundant promise, beset the farmer on every hand, to lead him away from the legitimate pursuit of his calling, and make him a prey to every form of imposture. When we remember that no man can afford to cultivate an acre of land for nothing, or even to resign it to a doubtful experiment one year out of the few allotted him here on earth, should we not rather learn of him who can tell us how he has reaped the largest reward, rather than of him who offers the large promises of Chinese sugar cane, or Hungarian rye grass? When we know that from a judicious application of those manures which in this region every farmer can collect for himself by the application of industry and economy, shall we not learn of him who does this work well, rather than of him who presents us an easier method by which we may enrich our acres, and would exhaust our soils, and our pockets, and our patience, with a long list of condensed substitutes for the fertilizing materials which lie all around us? It is the recorded operations of skilful and successful farmers, which may teach us how far to yield to these temptations, and how far to avoid them. It is this instruction which our farmers need. And if one of their number has raised the largest crop of corn, or carrots, or hay, let him teach the rest how it was done, with what manure, with what land, with what seeding, with what cultivation. If one has reclaimed swamps and meadows profitably, let him tell us how, that we may go and do likewise. These are the teachers, who, if they will, may make an agricultural college out of every farm in our county.

The benefit of every accurate and systematic attempt at farming in our country is twofold—to him who makes it, and to those who observe and study it. There is no doubt that men in Massachusetts cannot pursue with profit the careless and wholesale modes of agriculture adopted in newer and more sparsely-settled regions of our country. There are certain branches of this industry to which our soil and climate are not adapted, and in which we cannot hope to compete with our neighbors. We have undoubtedly yet to learn what we can most advantageously raise on our land—what is best adapted to our home market—what is brought into the least competition with crops brought from regions better adapted to their production. Before the hog crop of Ohio became a staple product of that great State, the farmer of Massachusetts found it profitable to raise and fatten pork. Before the existence of the present rapid communication between our large cities and the rich pastures of the West and South-west was established, the production of beef was a source of large profit to our community. But are these things so now? Has it been determined whether the conversion of crops into beef and pork is the most profitable mode of disposing of them? Can the farmer, who for years has fed his corn and hay to animals fattened on his own premises, and who has received in this way a fair remuneration for his labor, assure you by figures that he has made the most possible out of that corn and hay? A farm, unless entirely neglected, will always pay something, but justice to the bounteous earth demands that it should be enabled to exert its largest capacity for the benefit of him who tills it. And this it cannot do if the labor bestowed upon it is scanty or misdirected.

There are in Essex County nearly three thousand farms, and about one hundred and fifty thousand acres of land improved. Our agricultural population is peculiarly prosperous. We have within our limits five large cities, and many thriving villages, which furnish us with excellent and convenient markets. One section derives a large annual income from its hay crop, another from its root crops, another from its dairy, and many from the garden and the orchard. Our farmers are not behind any portion of the State in their industry and enterprise. And yet it is doubtful whether, on the whole, the agricultural interest of the county is improving. Our pasture lands are deteriorating. Our woodlands do not increase in value, in profitable ratio. Our hay crop does not increase as it should. Our old orchards do not renew their youth under kindly care. The wet lands of the county yield their wretched crop of meadow hay, just as they did half a century ago, instead of smiling under a burden of sweeter grasses, for the production of which they have been warmed by dyking and draining. This ought not to be. At the present price of land per acre, and at the average price of hay, it is now more profitable to reclaim wet lands than it is to labor in most of the mechanical occupations, or to engage in most of the smaller branches of trade—not easier, perhaps, but more surely profitable. Is there any reason why our farmers should not emulate each other in improving their pasture lands and meadows, and vie with each other in rendering an accurate account of the expense and profit or loss of each operation? These pastures and meadows occupy a large portion of the county, and may be made a source of large profit, if carefully and economically improved. Is there any reason why our farmers should not learn of each other in this matter?

And then, again, the selection and care of animals for our farms; how much may the farmers of each locality teach each other in this respect! With the exception of those farms devoted to market-gardening, and to small tracts of land receiving their manure from the sea, cattle-husbandry in its various branches lies at the foundation of our farming. Let every farmer resolve that he will stock his farm to its utmost capacity—and what should we see? The acre which now yields a ton of hay, would soon be forced to double that crop,—in the beginning *for* the cattle, and afterwards *by* the cattle. That old pasture now overrun with briars and bushes, and capable of feeding two or three cows, which are obliged to travel and work for a living from sunrise to sunset, would soon be called upon to feed ten times that number, and the expense of reclaiming would be paid by the cows. Whatever is done upon the land for the benefit of cattle, always receives its return from the cattle themselves, if they are properly selected and properly used. What a subject for inquiry and investigation is here opened! Can we not learn of each other the class of animals best adapted to our soil—whether for the dairy or shambles; and having determined this, may we not arrive by a system of experiments at the most economical mode of feeding so as to produce the largest result?

We were once told that thirty thousand sheep could be fed in the county, in addition to the stock already kept, without any appreciable addition to the agricultural expense of the county. Can this be demonstrated? There is no doubt of the profits to be derived from sheep husbandry; and there is no doubt of the advantage to be derived to the pastures upon which they are fed. There seems to be no reason why a careful and systematic experiment of this branch of agriculture should not be made among us. We live in a region surrounded by markets for wool and mutton. We have pastures which need the beneficial effects of sheep-feeding. And yet an enterprising and public spirited citizen of our county devotes his time and a portion of his ample means to the introduction among us of the most approved breed of mutton sheep, now known in England, and not only are the best of his flocks purchased by farmers in other parts of the State, but the choicest rams imported by him from Oxfordshire, are passed by unheeded at our exhibitions. If there is profit in sheep husbandry, let those of our farmers who have tried it give us the balance made by rearing and feeding; let them ascertain the most profitable animal to feed, whether fine-woolled or coarse-woolled, whether Merino, or Cotswold, or Oxfordshire Downs, or South Downs, or Leicesters. If the profits and advantages of sheep husbandry are what its advocates assert, there is no reason why three thousand farmers in Essex County should not reap their proportion of these profits, nor why the three thousand farmers should not be benefited by these animals.

We have hastily referred to some of the topics in which our farming community is concerned for the purpose of awakening if possible an interest in them, sufficient to insure that amount of experiment and information which always grow out of industry and honest emulation. A well-managed farm—a farm devoted to one crop in the main, or devoted to "mixed husbandry"—is a study worthy of every farmer. The details of a successful operation in growing corn, or wheat, or rye, or barley, or roots, or grass, or fruit, are always interesting and profitable; but they may be given by a farmer who with the exception of this one crop, has come very far short of good farming. His general system of husbandry may be very deficient. His buildings may be badly arranged. His manures may be unskilfully applied. His system of feeding may be careless and extravagant. His farm accounts may be loose and inaccurate. How much more valuable, therefore, are the details of a well-conducted farm in the whole—a statement of the preparation and application of manures, of the time of planting, of the mode of cultivation, of the choice of animals, of the profits on the crops, of the expense of labor, of the method adopted to bring the farm up to the standard of good agriculture. We would urge upon our farmers an increased interest in the entry of their farms for premium, confident that they will derive a benefit from it, compared to which the premium is a mere trifle, and assuring them that while they benefit themselves, they will also benefit the community in which they live. We have many good farmers among us, skilful, prosperous, thriving men, who manage their farms well; and whose example and information ought not to die with them. We trust that another year will find them carefully recording their operations, and offering them for the guidance of others.

George B. Loring, *Chairman.*

HAMPDEN.

Statement of Dr. Lawson Long.

The farm, the management of which is here detailed, contains thirty-one acres. One acre is occupied by buildings and yards, seven acres are in tillage, seven in mowing, twelve in old pasture, and three in new pasture, coming into grass, where the wood has recently been cut off.

The stock on the farm consists of one farm-horse, weight twelve hundred pounds, kept up all the year, one family and business horse, weight one thousand pounds, also kept stalled all the year, four cows from four to eight years old, and three heifers two and three years old, stabled every night, and kept in pasture from the tenth of May to the first of November.

We shall manufacture, the present year, thirty-five cords of composted manure, which is a thorough mixture of all the liquid and solid manure, with all the straw we raised, used for bedding cattle, refuse corn butts, etc., mixed with good soil, and shoveled over five or six times before going into the ground. The same process is observed as published in the Hampden County Agricultural Report for 1859. All the manure is put into the soil, none is used for top-dressing. Our rule is to give our tillage ground, generally, five cords of compost per acre, either ploughed in or put in drills. Cabbage, which is followed by wheat and stocked down to grass, with one peck each of Timothy and redtop, receives ten cords per acre.

Lot No. 1. Potatoes.—Forty-nine rods of ground following potatoes second year of tillage. It was ploughed ten inches April 15th, composted in drills, and early "Carters and Jacksons" cut and planted, one piece to the hill, one foot apart. They were hoed twice and dug July 20 to 26, yielding forty-eight bushels of merchantable potatoes, weighing sixty-nine pounds to the bushel. They sold for forty-five dollars and ninety-six cents. There were also seven bushels of small potatoes worth two shillings per bushel. Manured again the last of July, and ploughed and sowed to flat turnips and stocked down. The turnip crop is estimated at one hundred and fifty bushels, which, at one shilling per bushel, is twenty-five dollars.

Lot No. 2. TILLAGE.—One acre and six rods was in winter wheat, of the red Mediterranean variety, following potatoes. It was ploughed and sowed about the fifteenth of September, with one hundred bushels of refuse gas lime which had been exposed to the weather two or more years, and stocked down to grass. It was threshed and cleaned in September, yielding, by measure, thirty-two bushels and three pecks, and by weight, sixty-four pounds to the bushel; making a little over thirty-five bushels lawful weight.

Lot No. 3. Three-fourths of an acre, second year of tillage in cabbage, following corn. Ten cords of compost were ploughed in, ten inches deep in April. It was ploughed again in May, and set with "Early York" and "Medium and flat Dutch;" guano and plaster were mixed and hoed in around each plant the two first hoeings. Sales to October 11th, seventy dollars and ninety-seven cents. The lot will bring one hundred and fifty dollars.

Lot No. 4. POTATOES.—One acre and a half, first year of tillage: ploughed with double plough, ten inches deep, the turf being handsomely buried in the bottom of the furrows. It was manured in drills, five cords to the acre, and planted with "Jackson," "Child's," "Davis's seedling" and "Lyman's seedlings." They were hoed twice, and yielded as follows:—

"Early Jackson's," one bushel of good potatoes to the square rod: "Davis's seedling," one and a half bushel to the square rod; "Child's," one and a quarter bushel, and the "Lyman's seedling," about one bushel to the square rod. The potatoes were all measured in two baskets, one weighing sixty-nine pounds and the other sixty-two pounds per bushel. After deducting the weight of the basket, one hundred and sixty-nine bushels sold for ninety-two dollars and thirty cents. Large and small of all varieties measured three hundred and eleven bushels.

Lot No. 5. One acre and twenty rods. Spring wheat followed cabbage and potatoes, sowed April 7th with fifty bushels refuse lime. On the cabbage ground the crop was excellent. On the potato ground, which was somewhat shaded by apple trees, about two-thirds as good. Harvested thirty-three bushels of wheat, sixty-two pounds to the bushel.

Lot No. 6. One acre in corn. The manure was ploughed in hills three feet apart each way, three stalks in a hill, hoed three times; unleached ashes were applied twice. It was estimated to yield sixty bushels of sound corn.

Lot No. 7. SWEDISH TURNIPS.—Forty rods manured in drills, and ridged by turning two furrows together, sowed the last of June and thinned to stand eight inches apart, estimated to yield two hundred bushels.

Lot No. 8. POTATOES.—One acre of turf, a part of which had not been ploughed before on account of surface water. It was drained with open drains, and ploughed ten inches with double plough, manured in drills, and planted May 20, with "St. Helena's" and "Davis's seedlings," cut and planted one piece to the hill and one foot apart. They were hoed twice, and the weeds cut or pulled a third time. Yield, two hundred and two bushels good and twenty-four small, by weight two hundred and forty-six bushels.

Lot No. 9. One-half acre in flat turnips. It is a part of Lot No. 4, following early potatoes, estimated to yield two hundred bushels.

MOWING LANDS.—Four acres were mowed twice, and estimated by those who mowed and secured the hay, to yield three tons per acre the first crop, and one ton per acre the second. On three acres we cut two and a half tons to the acre. I have bought meadow grass to the amount of fifteen dollars, about two acres—mostly swale. I have put three tons in my horse barn, and filled the other, thirty by thirty-eight, one bay on a level with the floor, and the other three feet above it—to the ridge. I think we have twenty-six tons of first quality hay. I do not know of any spot of foul grass in my meadow land.

PASTURE.—My pasture of fifteen acres has been excellent through the season, and is still good—October 11. From seven cows we are making at this date, one hundred and twenty-five pounds of butter per month, besides the sale of all the milk on Saturdays to the milk-men, and what we use daily in two families. Our cows are fed with cabbage leaves and swedish turnip leaves for nightly fodder. The pasture has annually half a ton of plaster sown upon it. Of fruit we raise a supply for family use ; of strawberries, several varieties ; of cherries, raspberries, Bartlett pears, peaches, plums and grapes ; and in common with every-body the present season, beautiful apples in abundance. Of some of these varieties we have a surplus, as reported in farm accounts.

FARM ACCOUNT.

	Cr.	
By 26 tons of hay, at $14, present price,	$364	00
1,200 pounds of butter, contracted for by the year,	300	00
4 quarts of milk per day in our two families,	58	40
Milk sold to milk-man, at 4 cents per quart,	50	00
Skimmed milk sold in one season,	100	00
68 bushels of wheat, at $1.75,	119	00
4 tons of straw, at $7,	28	00
Cash for potatoes sold,	142	30
400 bushels potatoes in store,	200	00
Corn, supposed to be 60 bushels or more,	50	00
Corn fodder,	14	00
Cabbage, (part sold) will be,	150	00
Pasturing 7 cows 24 weeks, at 50 cents,	84	00
1,600 pounds of pork, at 8 cents,	128	00
Spring pigs, sold 8 at $4,	32	00
6 on hand, 6 weeks, at $2, (sold)	12	00
60 bushels winter apples, at 50 cents,	30	00
200 bushels common apples, at 10 cents,	20	00
Grapes, sold,	7	00
Grape juice for wine, 8 gallons,	16	00
Cherries sold,	12	00
Garden vegetables in families,	30	00
Wood sold and used, 30 cords,	150	00
200 bushels swedes, and 350 bushels flat turnips,	91	40
Poultry,	20	00
Calves sold,	7	00
	$2,215	10

	Dr.	
To int'st on money invested for farm, $4,000,	240 00	
" " " in stock, $300,	18 00	
Labor of one man, and board,	240 00	
" woman, and board,	100 00	
1 hired man and board,	144 00	
1 boy's help and board,	30 00	
Taxes,	15 17	
Shingling tenant's house,	30 00	
1 bag guano,	4 50	
Half ton of plaster,	4 00	
Grass seed,	3 00	
Grass bought,	15 00	
Salt,	3 00	
35 cords manure compost, one-half supposed to improve land,	70 00	
Interest on tools and incidentals,	20 00	
		$936 67
Balance in favor of farm,		$1,278 43

Holyoke, October, 11, 1860.

Statement of A. L. McKinstry.

The farm which I enter for the three years' premium, is situated in the town of Chicopee, and contains about sixty acres of land. Of these, twenty-four are in a good state of cultivation. A large portion of the balance is low and wet, producing bog grass. The upland portions from long continued close pasturing are not very productive. Thus much for the present condition of the farm, though perhaps the best index is the amount of the crops raised the present year.

6	acres	grass, 10 tons, (measured) at $12,	$120 00
8¼	"	corn, 320 bushels, (measured) at 80 cents,	256 00
8¼	"	corn stover, 10 tons, (estimated) at $7,	70 00
2	"	potatoes, 328 bushels, sold for	135 35
2½	"	rye, 52 bushels, at 80 cents,	41 60
1	"	oats, 60 bushels, at 50 cents,	30 00
⅛	"	tobacco, 2,000 pounds, (estimated) at 10 cents,	200 00
2½	"	turnips, 957 bushels, at 10 cents,	95 70

½ acre carrots, 345 bus., (50 lbs. to the bus.) at 30 cts.		$103 50
½ “ parsnips, 160 bushels, at 40 cents,		64 00
¼ “ Hubbard squashes, 2,000 pounds, 1½ cents,		30 00
1 “ cabbage, 2,500 heads, (merchantable) at 3 cents,		75 00
30 barrels apples, at $1,		30 00
1,063 lbs. butter, made since 1st of May, sold for 24 cts.,		255 12
1,000 quarts milk, sold for 4 cents,		40 00
Skim milk fed to calves,		41 00
“ “ pigs,		32 00
322 dozen eggs, sold for 20 cents,		64 40
60 chickens, at 30 cents,		18 00
		$1,701 67
Deduct hired labor, board not included, one man, one year,	$126 00	
Deduct hired labor, one man, 8 months,	120 00	
“ “ boy, 6 months,	24 00	
“ “ woman, one year,	75 00	
“ grain used,	75 00	
		420 00
Profit,		$1,281 67

No allowance is made in this account for the labor of myself and wife, or for the board of hired help, taxes, &c.

In addition to the crops enumerated above, there have been raised two acres of sowed corn, which, together with small potatoes, pumpkins, &c., were fed to stock in summer and fall, of which no account has been made; neither has any account been made of the milk and cream consumed by a family of eight persons. The team work on the farm has been performed by one horse, with the exception of the ploughing, to assist in which I have exchanged labor with a neighbor.

Eleven cows and one yearling heifer comprise the neat stock on the premises, which are managed as follows:—

In the summer they are pastured, but stabled at night, being confined by stanchions upon a platform, with a trench in the rear which is supplied each day with dry muck. Managed in this way no fodder is wasted, the cows are kept clean, the manure is all saved under cover till used. During the past year, the amount manufactured in this way has been about one hundred cords. In winter the food for the stock consists of cut hay and corn fodder mixed with scalded meal, to which is added a liberal supply of roots. The amount of butter in one year has been two thousand and two pounds, which, allowing one cow for the use of the family, makes about two hundred pounds per cow.

The poultry account stands thus:—Eighty hens of different varieties—the Black Spanish predominating and preferred—have been kept. The number of eggs produced in one year, four hundred and ninety-six dozen. Sixty chickens have been raised, which, together with the eggs, make the sum of one hundred and seventeen dollars and twenty cents. Their food has been corn and oats, at a cost of forty-six dollars; one barrel of bone-dust has been used, which adds two dollars and fifty cents to the expense. A profit is left of sixty-eight dollars and fifty cents.

In the statement which follows, stating the labor expended on each crop, ten hours has been considered a day's work, at one dollar per day. The same has also been charged for the labor of a horse, which has been introduced whenever it was practicable.

Oats.—One acre was sown April 10th, with three bushels of seed per acre. Harvested sixty bushels. Allowing the straw to pay for the threshing, the expense for labor would be seven dollars, or about twelve cents per bushel.

Corn.—This crop was raised in three separate fields, planted in rows four feet apart with the hills three feet.

Lot No. 1 was on the plains. Twenty dollars worth of fish guano was applied to three acres; planted May 22d. Twenty-four days' labor were required to cultivate the crop till it was ready to cut up. Allowing the fodder to pay for cutting up and husking, the cost of labor is eight dollars per acre, or thirty-two cents per bushel for the corn.

Lot No. 2, containing four acres, was manured in the drill with fifteen cords of stable manure. The amount of labor per acre till the time of cutting up was eleven days. The amount of corn per acre was about forty-five bushels, produced at a cost of twenty-five cents per bushel.

Lot No. 3, containing one and one-fourth acre, was manured at the rate of ten cords per acre, spread broadcast and ploughed under. The yield of corn was at the rate of sixty bushels per acre, raised at a cost of sixteen days' labor, or about twenty-six cents per bushel.

POTATOES.—Dovers were planted on one acre. After ploughing, the drills were made with a double mould board plough, three feet apart; potatoes which were too small for table use were then dropped one foot apart; tobacco stalks cut into six inch pieces were then dropped, to which was then added a slight sprinkling of ashes, plaster and salt. The whole was then covered by running the plough between the rows; a bush harrow was then passed over the piece, which left the field nearly level. When the potatoes were three or four inches high, all but four of the stalks in each hill were pulled out. Seventeen days' labor were required to complete the work. The result was one hundred and seventy-five bushels of potatoes, at about ten cents per bushel.

Davis Seedlings were planted on one acre in the same manner as the preceding, with the exception that the land was manured with the tobacco stalks which grew on two acres. Thirteen days' labor finished the cultivation and harvesting of this crop, raised at an expense of about six cents per bushel. One row left without manure showed a deficiency of crop amounting to twenty-five bushels per acre, as compared with the other rows.

CARROTS.—Half an acre was manured at the rate of fifteen cords per acre. The carrots were sown in drills three feet apart, May 14th. Harvested three hundred and forty-five bushels, weighing fifty pounds per bushel, at an expense of twenty days' labor, or about six cents per bushel.

PARSNIPS.—Half an acre was manured at the rate of ten cords per acre. Sowed May 14th in drills three feet apart. Harvested one hundred and sixty bushels at an expense of eighteen days' labor, or a cost of about eleven cents per bushel.

TURNIPS.—Two and a half acres were sown on rye stubble, from July 29th to August 7th. The drills were made three feet apart, and manure at the rate of four cords per acre was applied in the drill. The seed was sown on this by hand, and covered with a hoe. The after cultivation was thinning and hoeing, using the harrow and cultivator when necessary. To one acre of the above a mixture of super-phosphate, ashes and plaster was applied in the drill to the value of about eight dollars, in the place of stable manure. The yield on this was four hundred bushels. On the whole piece it was nine hundred and fifty-seven bushels, costing three and three-fourth cents per bushel.

CABBAGE.—One acre was manured in the drill with five cords of fine manure. The plants were set two and a half by four feet. Twenty-five hundred heads of merchantable cabbage was raised, at an expense of thirteen days' labor.

TOBACCO.—One and one-eighth acres received fifteen cords of manure per acre. Commenced setting June 16th, in rows three feet by two. Labor, not including the stripping, forty-eight days. Amount of crop, by estimation, two thousand pounds, costing, before stripping, nearly two and a half cents per pound.

CHICOPEE, December 1, 1860.

NORFOLK.

Report of the Supervisory Committee.

The Supervisory Committee, in pursuance of their duties, visited some farms in the county during the past season, but owing to the engagements of some of the members, were not able to make as extensive observations as they otherwise might have done.

The farm of Hon. Josiah Quincy, of Quincy, now in the occupancy of his son, Hon. Josiah Quincy, Jr., consists of 500 acres, about one-half of which is woodland. It came into the possession of the first American ancestor of the family, Edmund Quincy, direct from the Indians, in 1636. It comprises a portion of what was the favorite corn-ground of the tribe from which the name of our Commonwealth was derived, and what was the home (so far as a savage can be said to have had a home) of Chickatabot, the reigning chief of "the Massachusetts" at the time of the first settlement of the English in the neighborhood. Here, too, was the cemetery of the tribe, or, at least, one of the places where they interred their dead. Their bones are not unfrequently disturbed by the processes incident to the civilization which has swept away these "native Americans," and left scarcely an outward mark of their existence.

The committee had the pleasure of an interview with the venerable proprietor of this farm, who, at the age of nearly ninety years, retains a good degree of the interest he has always felt in agricultural improvement. He informed us that the dwelling in which he resides, was built by his grandfather in 1760; that he began agricultural operations here in 1797. The long and beautiful avenue of trees leading from the highway to the house, which attracts the attention of every passer-by, was planted by him. He built the principal barn on the farm in 1808. For many years it was regarded as the best in the State, and is yet well worthy of examination, both on account of the convenience of the original plan, and the extensive accommodations it affords through additions which have been made. It will hold two hundred tons of hay and shelter one hundred cattle. Mr. Quincy early turned his attention to the keeping of live stock on the soiling system, and in 1814 adopted it for all the stock kept on the farm. Many of the results of his great experience on this subject are embodied in an essay which he kindly furnished for the Transactions of this Society for 1852, and in a previous essay published in the Journal of the Massachusetts Society for Promoting Agriculture for 1820; both of which, with other observations, are comprised in a work prepared by him in 1859, entitled "Essays on the Soiling of Cattle, Illustrated from Experience; and an Address containing Suggestions which may be useful to Farmers." It may be safely assumed that Mr. Quincy has done more than any other man to introduce the soiling system into this country.

As before stated, the farm is now managed by Mr. Quincy, Jr., who pursues essentially the system formerly followed by his father. His principal object is the production of milk, which is taken to Boston,—the price, at the barn, per can of eight and a half quarts, being twenty-eight cents in summer and thirty-six cents in winter. He keeps seventy-two cows. At the time of our visit, 26th of July, fifty-four cans of milk (of the size just mentioned) were obtained daily. But we cannot state the length of time the cows had been in milk, or their nearness to calving, which, of course, affect the quantity they would give. The mode of feeding was as follows: once a day on hay, twice on green fodder, and once on chopped hay with two quarts of cotton-seed meal to each cow,—the meal mixed with the hay.

The green fodder was cornstalks, clover and tares,—the latter being tried by way of experiment. The crop was a fair one, and will probably induce a repetition of it, which may settle the question of its adaptability to this purpose in this country. It is highly valued in England as a green forage crop. Water is brought to the barn by the action of a hydraulic ram, and conveyed to a trough in the manger of the cows. They, therefore, take all their food and drink in the barn, but are turned into a yard four hours a day. They appeared to be in good health and condition. The operation of spaying had been performed on several of the herd, but time enough had not since passed to show its precise results.

Muck is mixed with the manure of the cows, by placing it daily in a trench in the rear of the platform on which they stand,—the quantity of muck being about equal in bulk to the manure. The mass is deposited in the barn cellar till wanted for use. It is mainly applied as a top-dressing for grass. It is proper to mention, in this connection, that Mr. Quincy had been experimenting with McDougall's Disinfecting Powder,—a substance prepared in England for the purpose of destroying offensive odors in stables and other places, and also for the purpose of preventing the escape of fertilizing matter in manures. The cow-stables where the powder had been sprinkled, were entirely free from smell. It may be mentioned, also, as a fact within the knowledge of some of the members of the committee, that this powder has been used with excellent effect in several large livery stables in Boston. Other experiments have also been made with it, which show that it possesses very valuable disinfecting powers.

The absence of interior fences, which were abolished upwards of forty years ago, on Mr. Quincy's farm, give it a park-like and agreeable aspect. It is, as has already been remarked, chiefly in grass, most of which is cut with a mowing machine,—Manny's, with Wood's improvement, being used with good success.

The committee understood from Mr. Quincy, that in his farming operations he was endeavoring to ascertain whether the business can be made profitable,—whether a gentleman can invest money in it with a reasonable certainty of realizing a fair return. We are gratified that a gentleman of Mr. Quincy's means, intelligence and energy, should have engaged so earnestly in the solution of this problem. As he had, at the time of our visit, conducted the business, in its present form, only ten months, he could not be expected to exhibit his balance-sheet. When sufficient time has passed for the results to assume a reliable form, it is to be hoped he will present them to the public, as, in any event, they can hardly fail to be useful as an example.

The farm of H. N. Glover, Quincy, both in regard to the condition and arrangements of the buildings, and the division and cultivation of the land, presents a good example of ORDER and NEATNESS, those fundamental principles of good farming. Mr. Glover invited us to look at a piece of marsh land, from which he had shut out the sea by a substantial dike. Below the dike are sluices, fitted with gates, which allow the water from the reclaimed land to escape, but prevent the inward flow of the tide. When the improvement of this land was commenced, it was, in most respects, like ordinary salt marsh, and had been so from the earliest account to be had of it; yet it is filled with stumps of various species of trees. No one has any knowledge in regard to the time when these trees were standing; but it is evident that they grew when the ground was free from the action of salt water. From the appearance of the surrounding land, it seems probable that a high bar formerly protected the marsh from the sea, but that by some unusual force the waves broke through, destroyed the trees, and changed the general character of the vegetation. Although this was done, perhaps, hundreds of years ago, the roots of the trees imbedded in the marsh are still perfectly sound.

In the fall of 1859, Mr. Glover planted cranberries on a portion of this reclaimed marsh. Of course, there has not been sufficient time for the plants to establish themselves. At present there is nothing discouraging in their appearance, and the public will be interested in the progress and result of this attempt to convert a salt marsh into a cranberry meadow.

On the farm of Lemuel Billings, Quincy, the committee saw a six-acre field of corn which promised a large yield. Mr. Billings has generally had marked success with this crop. The land is prepared for it by spreading seven cords of cow manure to the acre and ploughing it in. The land is warm and rather light. He cultivates carrots to some extent, which are fed to cows; has sometimes obtained twenty tons to the acre. We passed over some of his grass land, where the crop had been cut with Russell's one-horse mowing machine, which Mr. Billings has used for several years. The work was done perfectly,—excelling in neatness, and the amount of the crop obtained, the ordinary work of the scythe. Mr. Billings has also used the same machine, to considerable extent, in cutting salt grass. As it runs on two wheels, the rims of which may be of any desired width, it readily passes over ground that is quite soft, and on which the horse requires to be shod with rackets; but with this protection there is no difficulty in cutting the grass on almost any part of the marsh, and it has sometimes been well cut when it was, to some extent, flooded by the tide.

Hon. Charles Francis Adams, of Quincy, is one of our largest landholders, owning in various farms in this town, about one thousand acres. His residence is that which was his father's and grandfather's—John Quincy Adams and John Adams, former Presidents of the United States. The birthplace of the latter distinguished gentlemen we shall have occasion to mention as we proceed with our remarks. The committee were gratified to see many fine and some rare species of trees, which were planted by the ancestors of the present proprietor, and not less gratified at the sight of others, which under his own direction, have added beauty and interest to the place. Several acres of land, lying on each side of a fine stream of water, have within a few years been converted from an unsightly waste to a beautiful meadow, producing large crops of good hay.

But Mr. Adams's principal farming operations are at Mount Wollaston, under the superintendence of his son. The farm consists of about four hundred acres. It is delightfully situated in regard to the view from it of Boston harbor with its numerous islands, and the surrounding country. It comprises the celebrated eminence on which Morton, that "pestilent fellow" to the Puritan settlers, established himself. Standing on the top of the "Merry Mount," and casting our eyes over the picturesque scene of land and water, we could but admire the taste which led that gay adventurer to select this spot as his residence.

The soil of the farm is mostly warm, and readily produces fine crops of Indian corn and rye, and in moist seasons, heavy crops of clover and grass. At the time of our visit, a second crop of clover was being cut from a field of twenty acres. Several of the committee expressed the opinion that they had never seen a better second crop of clover—the yield being estimated at a ton to the acre. The first crop had been much heavier. Both crops, as well as most of the hay crop of the farm, had been cut with the Buckeye mowing machine, the operation of which gave much satisfaction.

The live stock of the farm consists of about fifty head, most of which are cows, the milk from them being sent to Boston. The cows have generally been selected from the common stock of the country, but a few Ayrshires have latterly been kept, the products of which have been such as to induce Mr. Adams to try the blood more extensively. He purchased in 1859 the Ayrshire bull Troon, imported the previous year by the Massachusetts Society for Promoting Agriculture, and is rearing several heifers, the progeny of this bull from selected cows of the herd.

The barns on the farm are commodious and convenient. The stock is not kept at the barns, except in the winter season, being pastured in summer. Much of the fodder is cut for the stock—a two-horse endless chain power, by which threshing and other work may be performed, operating the cutter.

At another part of the town, near Braintree, the committee called at another of Mr. Adams's farms—one on which stands the ancient mansion (ancient for our country) in which the two Presidents, John and John Quincy Adams, were born. Its style of architecture by no means agrees with the fashion of this generation, but it is still in good condition, and under the management of a neat New England housewife, its interior presents an appearance of comfort which may often be sought in vain in more modern and pretentious dwellings.

This farm, consisting of about two hundred acres, has been leased for several years to Mr. Charles A. Spear, whose management presents such an example of the profits of farming as is seldom seen in this country. He pays a rent which is considered equal to a fair interest on the value of the farm—not, of course, what some of it might be worth for house-lots—and makes for himself a satisfactory profit—thus making tenant farming profitable to both landlord and tenant. By the improvement of some portions of the farm and greatly increasing the growth of grass, he has been enabled to more than double the number of cattle kept. The improvements have been expensive, but have still been made to pay. On some boggy and wet lands, which were formerly actually worthless, so far as regards the production of a crop, he has expended one hundred dollars per acre in drainage and covering with earth—mostly gravel—yet it has for five years paid the interest of more than two hundred dollars an acre. It has produced an average of more than three tons (at two cuttings) of good hay to the acre each season. The produce of the farm is converted chiefly into milk.

The farm of Jacob F. Eaton, Quincy, consists of forty acres, all of which, except an acre and a half, is adapted to tillage. It is a milk farm, and the number of cows and other stock kept, is unusually large in proportion to the extent of land—being twenty-nine head of cattle and eight horses. The farm has produced all the fodder required for wintering this stock, with the addition of forty dollars' worth of grass bought, and the salt grass of ten acres of marsh. Besides this, it has afforded summer forage sufficient to half support this large stock. The cattle are pastured on a tract that only yields about half grass enough for their support, and they are therefore fed at night, in the barn, with green corn.

For winter fodder, Mr. Eaton relies much on barley, cut in the milk and dried. The barley hay is run through a cutting machine, and cotton-seed cake or meal is mixed with it at the rate of two quarts per cow, morning and evening. The cows get one foddering of salt hay and one of upland hay, uncut, each day. This is found to be a good mode of feeding. The cotton-seed meal has been used for several months, and Mr. Eaton is well pleased with it. The cattle were in excellent health and condition, in December, when our notes were taken. He formerly fed with brewers' grains to much extent, paying ten cents a bushel for them, which he thought cheap; but latterly, by a change in the brewers' process—the grains being cut to pieces—the nutriment is nearly all taken out, and though but eight cents a bushel is the price, Mr. Eaton thinks them entirely too dear at that.

During the last season, Mr. Eaton has kept one hundred and thirty-five hogs, which are fed on the swill collected by the city of Boston. An important object in the keeping of these hogs, is the increase of manure, to be used in increasing the products of the farm. He top-dresses grass land with ten to fifteen ox-cart loads of manure to the acre, and for tillage crops manures much heavier—sometimes, as for roots, and Indian corn, as high as forty loads to the acre. The root crop is chiefly carrots, which are fed mostly to horses, at the rate of six or seven quarts to each horse per day.

We have said that an acre and a half of Mr. Eaton's farm is not subject to tillage. It is devoted to a more profitable purpose, as it produces three good crops annually—two in summer and one in winter—the latter, probably, the *most* profitable. The two summer crops are hay, and the winter crop is ice. In answer to our inquiry as to the effect of winter flowage on the hay crop, Mr. Eaton stated that the crop had rather increased in quantity, and that the quality had not deteriorated. It is not unlikely that the high manuring of some of the surrounding land may have had an influence in these results. We should add, that Mr. Eaton bought this farm eight years ago, giving three hundred dollars an acre for some of it, and that it did not then produce hay enough to keep ten cows.

The farm of J. W. Robertson, Quincy, adjoins that of Mr. Eaton, before noticed. The homestead consists of about seventy acres. He keeps about forty head of cattle—all cows, except one or sometimes two yoke of oxen—and seven horses. The main object is milk. He has one hundred and forty hogs, which are fed on Boston swill. We should state that most of the hogs kept by Mr. Robertson and Mr. Eaton have been bought at Brighton Market; but Mr. Robertson is making the experiment of rearing some. His mode of feeding stock is similar to that followed by Mr. Eaton, except that he uses Indian corn meal instead of cotton-seed. His premises, like those of his neighbor, Mr. Eaton, present an attractive appearance in regard to the character and good condition of the buildings, fences, and the general neatness observed in all parts.

Before dismissing the town of Quincy, it is proper that we should notice another product for which it is somewhat famous. When a gentleman belonging to one of the Southern States inquired what were the export articles of Massachusetts, he was answered by a distinguished member of this society, "Granite and Ice." It is not our purpose to enter at large on the value of either of these products, but the prominence which this town has always maintained in the granite business, justify a few remarks in regard to its importance.

By the kindness of Messrs. Thomas Hollis and George Penniman, we are enabled to give some interesting facts in regard to the origin and importance of the quarrying of granite in this neighborhood. The first building of note for which the Quincy granite was used, was King's Chapel, in Boston, erected in 1749, the stone of which it was built having been "picked up" in the woods. It was not quarried,—the splitting of stone by wedges being then unknown or not practiced here. Boulders were broken by hammers to such an extent as was practicable for obtaining pieces of the desired size. The first quarrying was in procuring the stone of which the State Prison at Charlestown was built, in 1815 (?). About this time the light-colored granite from Chelmsford, Concord, N. H., &c., began to be used for building in Boston to considerable extent. In 1817 the old Dedham jail was built of Quincy granite, and this may be taken as the date of the commencement of the quarrying business. Fashion turned from the light-colored in favor of what is called the blue granite. The Leverett Street Jail, Boston, was built of it in 1820, and a large demand for the article soon sprung up. In 1825 the Granite Railway Company, Col. Thomas H. Perkins, president, was incorporated. This association built, in 1826, the railroad leading from the quarry to tide water, for the purpose of taking stone to boats and larger craft. This was the first railroad in New England, and probably the first on which iron rails were laid in the United States. The Bunker Hill Monument Association owned what was called the Bunker Hill Quarry, to which the railroad was extended, and from which the stone for the first forty feet of the monument was taken. This quarry is now owned by the Granite Railway Company, which is still extensively engaged in quarrying and dressing stone. No less than eight other companies are now similarly engaged in this town. They give employment to six hundred men, in quarrying, hammering, &c., whose average wages are $500 a year—making an aggregate annual disbursement of $300,000. Probably the sum which has been paid for labor at the quarries during the last ten years, has not been less than $3,000,000. If this amount had been obtained for gold or silver, it would have produced an excitement in the country. The supply of stone is apparently inexhaustible. It is valued in the quarry at one cent per cubic foot. When the Granite Railway Company purchased their land here, they paid about $40 an acre for the greater part; but for the quarry proper, they paid $1,000 an acre. The deeper the quarry is worked, the better is the quality of the stone.

Among the noted buildings which have been built of the Quincy granite, are the Custom House, Merchants' Exchange, and Court House, Boston; Custom Houses of New Orleans, Mobile, Providence and Portland. Exchange, and Astor House, New York. The celebrated Fort Sumter, in Charleston harbor, was also built of this stone. The noble rows of stores on Commercial Street, Franklin Street, and in other parts of Boston, built of this material, attract the attention of every visitor to the city, and are acknowledged to be unsurpassed in appearance in this or any other country. Some trials which have lately been made in sculpturing the Quincy granite, show that it is susceptible of being worked with good effect. Monuments of ornamental character have been wrought from it, and the success which has attended the attempts to use it for such purposes has been such, that arrangements have been made to carry on this branch to considerable extent.

The Granite Railway Company employ five or six yoke of oxen in work about the quarries. They are of the largest size that can be obtained, though it is necessary that they should unite a good degree of activity and energy with great strength. We have never seen finer oxen of this class, than several of those shown us by Mr. Penniman. They cost $150 to

$200 per yoke; are so well fed that they would make good beef at any time; are worked about three years on the average, when, with a little additional feeding, and a short term of rest, they are sold to the butcher for about the amount of the first cost. They are fed chiefly with Indian corn meal and hay.

Several places were visited in West Roxbury. Arthur W. Austin, of this town has a farm of seventy-two acres—thirty-one of which, however, have been added during the last year. All the buildings have been erected by Mr. Austin, who has resided here for fourteen years. He has made striking improvements. His first object was to enclose the land with a permanent fence, which has been erected in the shape of very handsome faced wall, of so solid and substantial a character, that his heirs and successors, to remote generations, will hardly have occasion to touch a stone for the purpose of repair. The materials of which the wall was built were obtained on the land, and consisted chiefly of boulders of pudding-stone, the removal of which was necessary to render the soil readily workable by the plough. There were several acres of wet meadow on a border of the farm, besides several wet spots in the upland. The meadow has been drained and brought into the cultivated grasses, producing two heavy crops of hay in a season. Some of the other wet spots have, by digging out a portion of the soil, been converted into reservoirs for water—drains conveying to them the surplus water of the surrounding land. Several of these sheets of water are already formed, and a much larger one will be made by excavating the rich muck from a spot on the tract lately purchased. They add much to the beauty of the place, occupied as they are by numbers of water fowl—swans, various species, and several varieties of geese, several species of wild ducks, and esteemed domestic breeds.

Fruit trees have been planted to a considerable extent, and have succeeded well. The fine collection of apples presented by Mr. Austin at the last exhibition of this society, will be remembered. Our attention was attracted by a piece of corn, which several of the committee considered very heavy, and promising the largest yield of any they had seen the present year.

Mr. Austin has lately imported from Ireland specimens of the celebrated Kerry breed of cattle. As he favored the society and the public with a sight of them, and of several other fine cattle belonging to him, at the last annual exhibition—a report in regard to which will be found in another part of the Transactions for this year—we need not more particularly notice them. We may add, however, that the committee were much pleased with the appearance of these cattle, and regard Mr. Austin as entitled to the thanks of the community for testing their adaptability to the wants of our farmers. They were imported in November, 1859, and July, 1860, and as none of them have yet come to milk, we must wait for a demonstration in regard to their dairy qualities. They have thriven rapidly since their arrival. They are believed to be the only pure specimens of the breed that have been brought to this country.

Charles A. Hewins, of West Roxbury, has four acres of land which may with as much propriety be called a "farm" as Miss Martineau's or any other person's premises, of the same extent. He has occupied the place for five years—has erected a house, which for convenience combined with architectural taste, attained by a moderate expenditure, is worthy of examination. Though doing business in Boston, where he spends the greater part of every working day, he takes time to direct the management of the place, and finds recreation, health and happiness in the various rural operations which are here carried on. The land is near the summit of a high swell, has a tenacious subsoil, and retains water. Mr. Hewins has underdrained a portion, on which he has planted fruit trees of various kinds, and they have thriven well. We have seldom seen finer dwarf pear trees, or those which produced better crops of fruit, in proportion to age, than we found here. Many will recollect Mr. Hewins as a frequent and successful competitor for the fruit prizes of this society. The committee were much pleased with the general laying out and universally neat appearance of this "farm of four acres," which, whatever its results in a pecuniary view, can hardly fail to *pay* in the enjoyment it affords its intelligent proprietor and his family.

E. R. Andrews, of West Roxbury, has a farm of one hundred and twenty acres, twenty-five of which is woodland. It is used as a milk farm, thirty cows being generally kept. They are fed mostly in the barn, at all times. He relies on green corn-fodder, chiefly, as feed in summer, and hay and roots in winter. He had eight acres in fodder corn and ten in roots, at the time of our visit. He had also a patch of rape, tried as an experiment. Its appearance was pretty good, but we cannot report the result. Some of his root crops—which consisted of carrots, sugar beets, mangold wurzel, and kohl rabi—looked well for a large yield, but the wetness of the season had rendered it difficult to keep the weeds down as fully as would have been desirable for the benefit of the roots.

Mr. Andrews' mode of cultivating fodder corn is somewhat peculiar. After being ploughed, the ground is furrowed, leaving spaces of about three feet. The cultivator or horse-hoe is then drawn lengthwise over these spaces, and the corn sown at the rate of three to four bushels per acre. A light plough is then run on each side of the beds, followed by a bush harrow in the same direction, which sufficiently covers the corn. This leaves the crop in broad rows, and it is cultivated with the horse-hoe. Once going through—as the corn, from the land being heavily manured, grows rapidly—is generally sufficient.

Mr. Andrews has made some experiments in spaying cows, having operated on thirteen. He commenced in April, 1859, with three; most of the others were operated on six to eight months previous to our visit, at which time ten of the spayed ones were giving milk. Several others had been fattened and sold. All those we saw, appeared healthy and in good condition. Two which were spayed a year ago last April, were giving an average of seven wine quarts of milk each, per day. These, of course, afford the best example of the effect of spaying, as the others have not had so long a trial. But it is hardly probable that any of the cows which Mr. Andrews has operated on, will show the effects of spaying to the best advantage. They were generally too old when operated on—many of them being ten years or more. Still Mr. Andrews is confident that those first operated on give more milk by the year than they did previous to being spayed. As to the quality of the milk, there has been no opportunity of testing it; it goes in with that of the other cows and is sold in Boston. Mr. Andrews thinks that by spaying good cows at five or six years old, an average of eight quarts of milk a day could be had by the year. He is determined to follow the experiment till he can know, with a good degree of certainty, what are its advantages. We may add that the French, who were probably the first to try this operation on cows in milk, claim that—"The yield of milk is not only superior with spayed cows, and not only is the fattening of these animals quicker, more easy and complete, but the milk will return a third more in butter and cheese, and the flesh is more succulent, tender, and more thoroughly penetrated with fat."

Mr. Andrews purchased last Spring the superior Ayrshire bull Albert, imported from Scotland in 1858, by the Massachusetts Society for Promoting Agriculture. His object is to rear some heifers produced by some of his best cows and this bull. Several of the cows from which he intends to breed, are very good, both as to size, shape, and actual produce of milk—some of them gave from fifty to sixty pounds of milk a day during the months of April and May last. It is hardly to be doubted that valuable dairy stock may be obtained from the proposed cross.

Hazen & Whittier, on a portion of what was the Keith farm, West Roxbury, showed us a very handsome field of corn, as also did James Hunt, on another part of the same farm.

George G. North, West Roxbury, owns the Jersey bull Marmion, which has taken the first prize of this society. Mr. North carries on farming successfully, but we had not the opportunity to examine his crops, which were at some distance from his residence.

T. G. Whytal, West Roxbury, has extensive green-houses and graperies, the surrounding ground being devoted to the cultivation of fruits and flowers. A walk through the establishment showed us that it was well kept, and that the fruits and plants indicated the hand of skilful culture.

Jeremiah Pritchard, West Roxbury, has one of the first grape-houses, on the "cold" plan, that was ever built in this country. From the hasty glance we took at it, the fruit appeared to be abundant and of fine quality. Mr. Pritchard has been a successful competitor at the shows of this society, for the premiums on grapes and other fruits. We were struck with the neatness of the grass ground about Mr. Pritchard's house and garden. The sod was shaved with great nicety, and we were not a little surprised when told that the work was done with a scythe. We call attention to this matter, because it is one on which the good appearance of a place very much depends.

Joseph M. Underwood, West Roxbury, showed us, in his buildings, garden, and surrounding grounds, what might be pronounced an example of perfect neatness. In the stable and other out-houses, nothing could be seen, so far as the eyes of the committee extended—and they went through every department—that could be moved or altered for the better. Even the microscopic eye of the fly, could not have discovered a spider's web. The garden may be said to have been free from every thing that it was not intended should grow, and the products were luxuriant.

Quincy A. Shaw is quite extensively engaged, at West Roxbury, in breeding horses. He has erected a commodious stable, tasteful in its exterior, and combining in its interior the principal conveniences to be found in the best structures of the kind in this country or Europe. He has several fine specimens of the English race-horse, among which are the stallion Balrownie and the mare Comfort, with several of their progeny. We saw here, also, the noted trotting mare Lady Sutton, with a beautiful Balrownie filly by her side, and other fine stock of various ages.

On the 15th of August a delegation from the committee attended the festival of the Franklin Farmers' Club, which was held in the Town Hall, Franklin. No one familiar with the exhibitions of the Norfolk Agricultural Society, can have failed to notice the prominent position, in various departments, occupied by the citizens of Franklin. Their zeal in the cause of agricultural improvement, prompted the organization of this Club, which was effected in January, 1860, and has thus far been eminently useful. Meetings have been held regularly, in the winter season, for lectures and discussions on agricultural topics. Subjects for experiment are assigned to different members, the results of which are reported to the Club. From the record of the secretary, we learn that the subjects thus assigned for the last year, were—Drainage, Ploughing in Green Crops, Charcoal as a Fertilizer, Salt for the Destruction of Insects, Bones as Manure for Pear Trees, Relative Value of Bones, Phosphate of Lime, Plaster, &c., for different crops.

We are not aware that the reports on these subjects have yet been made public. If the experiments were properly conducted, the results could not fail to be interesting and valuable. We would suggest that they be reported for the Transactions of this society, in order that the public may know the conclusions arrived at, and the manner in which the experiments were conducted. We would suggest, also, that the experiments be repeated from year to year, until a succession of results may indicate a reliable solution of the questions involved.

About two hundred persons, comprising the members of the Club with their families and invited guests of both sexes, attended the festival alluded to. The company partook of a substantial dinner, after which appropriate speeches were made by various gentlemen—the exercises being agreeably interspersed with rural songs. The occasion was a pleasant, and we trust, a profitable one, to all present.

The committee may here say that they have great confidence in the usefulness of farmers' clubs, under judicious management. Their advantages have long been acknowledged in England and Scotland—some of the most important improvements in agriculture in those countries, having originated with these associations. In our own country they have not been numerous till within a few years, but their benefits are already apparent. We need not enter into an argument to show *how* they tend to improve the "soil and the mind"—the fact is obvious to all who properly consider the subject. We would suggest to the society the expediency of offering special encouragement to farmers' clubs, by a premium to such as should exhibit proof of having brought out the most valuable results, in the solution of questions, the suggestion or attainment of improvements, or in any way eliciting light in the various departments of agriculture.

On leaving the table at the festival above spoken of, the company was invited to look at some improvements of land by C. L. Metcalf, a member of the Club. The land comprises several acres lying on both sides of a brook, a portion of it having, till lately, been considered "poor old pasture," and the remainder being more or less boggy. The price paid for the tract, about three years ago, was ten dollars an acre. Ditches have been cut around and through a portion of the bog; on the softest parts gravel has been spread, the surface smoothed, and grass seed sowed, with a dressing of two hundred and fifty pounds of Peruvian guano to the acre. The first so prepared has been mowed twice, in 1859 and '60—though it has had only one application of guano. The last crop was estimated at three tons to the acre, but may have been somewhat overrated, as it is well known that crops on low land are not as heavy in proportion to their bulk as upland hay; but the luxuriant growth of the second crop,—which at the time of the visit of the committee promised to be heavy,—indicated that the first crop must have been correspondingly large. No manure has been applied, except one dressing of guano, as above mentioned. On another part of the bog, the surface was taken off in 1859, two inches of coarse sand spread on, and grass seed sown in September, that year. A fair crop of hay, probably a ton to the acre, was taken from the land in 1860. We noticed that the land seemed soft, and that the water in the ditches was in many instances within a foot of the surface. Unless the water can be kept down so as to afford a greater depth of dry soil, it will hardly be practicable to secure the growth of upland grasses for a long time, or obtain hay of the best quality.

On a portion of the upland, Mr. Metcalf has tried irrigation. By damming a small rivulet, he was enabled to take the water along a hill-side and throw it over considerable land, a part of which was in clover and a part in redtop and Timothy. The effect, he states, was highly advantageous, both on the clover and grass. His practice was to let on the water two days and shut it off two, through the months of April and May—would continue it into June, if the weather should be very dry. Mr. Metcalf is an earnest advocate for irrigation, and has found out, what some are slow to understand, that all irrigated land should be *well drained*, either naturally or by underdrains.

These improvements are evidently of a character that *pay*, though more time is required to enable us to fix their precise value. We are pleased to learn that Mr. Metcalf is about to apply irrigation on a larger scale, and we hope he will give the society the results.

We may add that there is no subject of greater importance to the farmer than irrigation. Although its advantages were set forth in strong terms in the report of the committee for 1859, we deem it proper to call attention to it. There is no mode of improvement that can be adopted with such great results in proportion to the expense, as this; and yet, strange as it is, none is so much neglected in this country. The fertilizing power of water seems almost wholly overlooked. In other countries irrigation is much resorted to, and even in this country we are not wholly without examples, which like that of Mr. Metcalf, demonstrate its advantages. It should be remembered that all the fertility, all the produce, obtained by water, is clear gain—nothing else is diminished or in any way injured by it. It is to be hoped that attention may be awakened to this important subject, and that the water which is now wasted may soon be made to produce crops worth to the country millions of dollars annually.

William Metcalf, Franklin, has made some experiments in the cultivation of forest trees. It was the intention of some of the members of this committee to have visited his plantation, but circumstances prevented. Some of the members of the society's committee having charge of this subject, examined the trees, and will, probably, report on them. In a call at Mr. Metcalf's residence for a few moments,—which was all the time at our disposal,—we saw that he was entering considerably into grape cultivation. The varieties adopted were mostly the best wild ones, though the Concord, Diana, and others are cultivated. The vines are not yet fully established, but appear to be doing well, and produced considerable fruit last season, unfavorable as it was.

S. W. Richardson, Franklin, president of the Farmers' Club, has made some improvements on his farm which are worthy of notice. Much of his land lies on the side of a considerable swell, and the soil is made cold and sour by a soak of water, while the subsoil has an almost impenetrable "hard-pan," formed by a deposit of iron. In this condition of the soil and subsoil, nothing of much value would grow; the land was overrun with low shrubs, intermingled with rushes and other aquatic vegetation. Some trials which were made in drainage a few years ago, indicated that it was very beneficial to this land, and Mr. Richardson has lately gone into the business on a larger and more systematic scale. A piece of wild pasture, hitherto almost wholly unproductive, was drained in the wettest spots, ploughed and planted to Indian corn last spring,—a portion manured with two hundred pounds of super-phosphate of lime, and another portion with the same quantity of ground bones to the acre, applied in the hill at the time of planting. A good crop of corn—estimated at forty bushels to the acre—was obtained. The manures used seemed to hasten the growth and maturity of the corn, for though it was what might be called frosty land, the crop was all sound and of the best quality. On a small portion of the field, wood ashes and plaster were used, in consequence of the super-phosphate and bones having been expended. The same value per acre was used of the ashes and plaster as had been used of the other articles. The result was very strikingly in favor of the super-phosphate and bones, as was shown by portions of the crop where all the articles were applied, being standing at the time of our visit. The crop was not only lighter where ashes and plaster were used, but it was not so well ripened.

Mr. Richardson has now dug ditches, at distances of about two rods, on another lot, and will complete the drains before the opening of another season. The ditches are about two and a half feet deep, and about a foot in depth of small stones forms the drains. Mr. Richardson has not tried tiles, as stones are very abundant on his land. We would suggest that tiles laid in one of the ditches—stones being used on either side—would settle the question as to which will best answer the purpose, without much expense.

The general appearance of Mr. Richardson's farm indicates that the owner believes in *progress*. Besides the improvements above spoken of, he is turning his attention to the culture of fruit; has a handsome young apple orchard, fine young pear trees, &c., and various kinds of grapes. Some fine specimens of the Catawba, very well ripened, showed the favorable character of the locality for the growth of this fruit. He showed us a handsome sample of Java spring wheat, of which he raised the past season twenty-eight bushels to the acre. His barn is convenient, and kept in neat order. There is a cellar under the whole, and much attention is paid to the saving of manure, though Mr. Richardson considers himself under a disadvantage in having no muck on his farm. The top soil, where walls are built, and the coarse grass, from wet places, are used as absorbents of urine.

The committee regard it as not beyond the sphere of their legitimate duties to notice some improvements, which, though they differ from those elsewhere spoken of in this report, are deemed of considerable importance. A few years since, Eliphalet Stone, of Dedham, sold to Irish and German laborers, portions of a tract of land, most of which had been considered of very poor quality for agricultural purposes. It is situated near Mill Village, and most of the purchasers are operatives in the manufactories there. The lots sold vary from a quarter of an acre to an acre, and the price paid was from $100 to $300 an acre,—the latter price referring to lots very favorably situated. Cheap, but decent cottages have been erected, Colonel Stone having, in most cases, assisted the purchasers in building, and they have improved the land chiefly for the production of vegetables. It has been a matter of no little interest to witness the success which has attended these operations in "cottage gardening." They have presented an answer, in part, to the question sometimes asked,—How can land be improved when there is no capital to begin with? These cottagers started with only such means of fertilizing their land as their families, and, perhaps, a pig, afforded. It was but a small spot that could be made productive at first, but the produce of this enabled them to increase the means of fertilizing a larger breadth. They produce most of the vegetables needed in their families, and a surplus which would feed another pig, or aid in supporting a cow,—thus increasing their quantity of manure, and enabling them to till more land, or increase the production of that before taken up. So they have gone on, and have produced crops,—particularly cabbages,—which would do no discredit to the best soil in the county.

We learn from Colonel Stone, that they have generally paid for the land, and seem encouraged to go on with its improvement. Their interest in the soil stimulates them to industry—they improve the leisure hours, which might otherwise be misspent, in increasing the productiveness and value of their possessions,—their interest in our country and its institutions is strengthened, and the effect on them, and on other citizens, is every way salutary and beneficial. It seems probable that a similar plan of making the operatives in manufactories interested in the land, might be advantageously adopted in many instances. It would give to such establishments a class of laborers that could be relied on, at the same time that it would afford to the laborers themselves a strong stimulus to faithfulness.

In Dorchester the Committee visited Hon. Marshall P. Wilder, president of the society. Our visit was on the last day of August, a season of the year which enabled us to examine with advantage the results of his extensive and long-continued labors in the production of fruits. It would have required more time than we had at our disposal to particularly notice all his operations, and we therefore confined our observations to the homestead, comprising thirteen acres, almost exclusively devoted to fruit and ornamental trees and plants. In the fruit department, the collection of pears, and in that of ornamental plants, the camellia particularly attracted our attention, as both have a reputation second to no similar collections in the country. It is well known that to these Mr. Wilder has devoted a long period of study and care, and is still engaged with the same earnestness that has characterized his previous efforts.

The collection of pears embraces about eight hundred varieties. Of these he has twenty-five hundred trees specially designed to produce fruit for market, and they are grafted with the most approved sorts for that purpose. As an evidence of Mr. Wilder's views in regard to such sorts, we may state that he has worked about 400 Beurré d'Anjou, 200 Buffum, 200

Doyenné Boussock, 200 Bartlett, and the balance about equally with Urbaniste, Merriam, Louise bonne de Jersey, Belle Lucrative, Flemish Beauty, Beurré Bosc, Vicar of Winkfield, Lawrence, Winter Nelis, &c.

To this collection of pears, amounting, as before stated, to about eight hundred varieties, now on trial, there are annually numerous additions, which Mr. Wilder receives through his correspondence with the various European and American societies of which he is a member. More than half the pear trees were originally grafted on the quince stock. These are all planted deep enough to cover three or four inches of the pear stock,—a system adopted by Mr. Wilder more than a quarter of a century ago, and to which he believes he is indebted for the great success which has attended this branch of his cultivation. By this method, the quince stock is protected from the borer, is kept soft, swells and keeps pace with the pear stock in its growth, and the latter frequently throws out roots. A large proportion of the pear trees are of the pyramidal form, and furnished with bearing branches to the bottom. As an evidence of his complete success with pears on quince stocks, he showed us trees of the Urbaniste which were but fifteen years old, and which had each borne a barrel of fine pears in a year. They were more than twenty feet high, and had borne fruit for twelve years. Their appearance at the time of our visit, loaded as they were with fruit of the finest character, elicited numerous exclamations of admiration. Trees were pointed out to us of the same variety on the pear stock, growing in the same square, and planted at the same time, which had never yielded a bushel of pears.

In relation to the cultivation of the ground for fruits, Mr. Wilder adheres to the opinion he has several times expressed in his addresses, on the necessity of thorough drainage and proper preparation of the soil. He considers these requisites of absolute importance for the production of fine flavored pears. He advocates surface manuring; protests against the use of fresh manure, the digging or ploughing deeply among fruit trees, and abjures reliance on circles dug around trees as a method of culture. The following extract from his last address before the American Pomological Society, presents his views on this point, which we regard as so important as to justify the space they here occupy. After objecting to the cultivation of any other crop among fruit trees, he remarks:—

"Equally injurious, in my own opinion, is the habit of deep digging or ploughing among fruit trees, thereby cutting off the roots, and destroying the fibrous feeders, which frequently extend beyond the sweep of the branches. However necessary the practice may be of cutting off roots in old orchards, in the process of renovation, it should be carefully avoided in grounds properly prepared, and where the trees are in a healthy or bearing condition. From experiment and observation, I am persuaded that working the soil among fruit trees, to the depth of more than three or four inches, should be carefully avoided. The surface should only be worked with a hoe, or scarifier, for the purpose of stirring the soil, and keeping out the weeds. Thus we avail ourselves of the advantages of what, in farming, is called flat-culture, at present so popular. For the same reason manure should not be dug in to any considerable depth, and some of our wisest cultivators now recommend its application on the surface. So favorably impressed with this practice is the Massachusetts Board of Agriculture, that it has ordered a series of experiments with cereal grains and other products in the application of manures on the surface as compared with specified depths beneath it. The practice of surface manuring is no novelty of our day. An eminent cultivator of fruits, nearly two hundred years ago, said, 'Manures should be applied to fruit trees in the autumn upon the surface, that the rains, snow, and frosts may convey the elements of fertility to the roots;' and 'that, by this method, one load will do more good than two used in the common way of trenching in to the depth of one foot.' Other distinguished cultivators and scientific gentlemen recommend the same practice. Hence we are of opinion that our orchards and gardens should be manured in the autumn, and on the surface, so that the manures may be thoroughly decomposed, made soluble during the fall and winter, and suitable for the nourishment of the tree early in the spring. In the history of this art, as of most others, it is wonderful how human opinions change. What were once considered as fundamental, are now rejected as unphilosophical or injurious, and those once rejected are now adopted as wise maxims. The doctrine has prevailed, from the time of Columella and Varro, that manures should not be exposed to the air, but should be incorporated with the soil as soon as laid out ; whereas, we have now the opinion of cultivators and chemists in favor of exposure to the air and other external agents of decomposition, and that it is not a source of nutrition to the plant, until it is thoroughly decomposed. This opinion is certainly corroborated by the practice of skilful gardeners in all past time, who will never use green manure in the potting or cultivation of plants, and only that which has become old and fine."

Although Mr. Wilder seeks for all the novelties of the orchard, his experience long since led him to the belief that we must look to our own seedlings, as a general rule, for the fruits best adapted to our location. His maxim is—" *Plant the most mature and perfect seed of the most hardy, vigorous and valuable varieties, and, as a shorter process, insuring more certain and satisfactory results, cross or hybridize your best fruits.*"

Acting under this impression he has a large number of seedling pears which have been produced from the best sorts in his collection, some of which have already borne fruit. His method of hastening their progress, is to engraft the seedling when it is only a year old, on a strong, thrifty branch, or on a mature stock. We saw shoots of these more than two feet in length, from seeds that had been sown the previous year. By this process the seedlings attain a strong, vigorous habit, and have plump, mature buds. These are then worked on the quince stock, which brings them early into a bearing state. Although Mr. Wilder advises the sowing of seeds which have not been artificially impregnated, yet he would encourage the crossing of the best varieties, where the cultivator has time, patience, and skill, the result of which will be more certain and expeditious. As an illustration of this principle, we may point to the great success of Mr. Wilder more than twenty years ago, in the application of this delicate and beautiful art to the hybridization of the Camellia, and by which he obtained the celebrated varieties of C. Wilderii and Mrs. Abby Wilder, and others which have not been surpassed to this day.

Mr. Wilder showed us, also, a large number of seedling, grape-vines which had been produced by the process of crossing. Some of these are expected to show fruit next year. He entertains the opinion that no country is better adapted to the extensive cultivation of the grape than our own, and that it is only a question of time when we shall have varieties adapted to almost every locality.

As before remarked, the committee had not time to examine, as they would have been gratified to do, Mr. Wilder's nurseries and farming lands, of which he has about fifty acres in addition to the homestead. In a field near the garden we saw the fine half-blood Jersey cows, which Mr. Wilder has several times exhibited at the shows of this society, where they have been justly admired. It is seldom that cows are met with in any breed, that present so many points of merit as these, and we can hardly suppress the wish that Mr. Wilder should carry out with them and their offspring, the same principles whose results he has so strikingly exhibited in various plants produced by crossing.

Wellesley Place, the country residence of Hollis H. Hunnewell, at West Needham, was visited by the committee on the 3d of August. It consists of about six hundred acres, including the beautiful lake Waban. On the southerly side of this is located the splendid mansion of Mr. Hunnewell, with the ornamental grounds. A few years ago, the larger portion of this place was covered with the natural growth of forest trees. Now it presents one of the best specimens of landscape gardening in New England. Mr. Hunnewell retained, in the laying out of this place, as many of the original trees as possible, and through these, the broad and well-turned avenues lead to the house and over the grounds. Interspersed among the native trees, and in belts along the broad walks, are planted specimens of all the popular trees and shrubs, both those of our own and other countries, that will endure the climate. From either side of his princely dwelling,—whether from the front, across the extensive green and velvet-like lawn, or from the rear, over the glassy mirror of lake Waban, or the interesting vistas which here and there open to the eye,—the views are charming and in good keeping with a correct taste for landscape gardening.

Although this place is more noted for its forest trees and shrubs than for fruits, his collection of the latter, both for open culture and under glass, will bear favorable comparison with the best in the vicinity. His grapes, nectarines, peaches, and strawberries, have seldom been surpassed.

In farming, Mr. Hunnewell is one of our most enterprising, though not one of our most extensive farmers, if we except hay, of which he cuts one of the largest crops in the county. Every thing he attempts is done well—a fact visible in every department. In farm stock and implements he has the best of their kind, and among the former were particularly noticeable his fine Jersey and half-bred Jersey stock.

We must, however, speak more particularly of the great efforts Mr. Hunnewell has made to introduce both old and new varieties of forest trees and shrubs, with a view to testing their adaptation to our latitude. Among the forest trees there are many fine specimens of the oak, elm, ash, beech, maple, magnolia, &c. He has also given great attention to evergreens, of which he has rare and beautiful sorts, which promise to become hardy with us. Such are the *Pinus excelsa*, *P. cembra*, *P. Benthamiana* *P. Lambertiana*, *P. Ponderosa;* the *Picea pinsapo*, *P. Nordmaniana*, *P. nobilis;* the *Thuja gigantea*, *T. borealis;* the *Cupressus Lawsoniana; Abies pyramidalis; Taxodium pendula; Juniperus ericoides*, and other coniferous trees. We must not omit the magnificent Norway spruces and white pines, profusely planted along the roads and over the grounds, nor the masses of choice shrubs which are grouped here and there under the trees and in the occasional openings. Here are the the *Andromedas*, the *Azaleas*, the *Rhododendrons*, the *Kalmias*, *Mahonias*, *Hollies*, &c. Here too is found, in a separate department, a collection of trees and shrubs with variegated foliage, such as the Striped-leaved Negundo, Silver-striped Oak, Beech, &c. Near the house was a very showy bed of tropical plants, which are to be removed to the green-house for the winter. This was called a jungle, and contained plants of the bamboo, banana, canna, &c. The greatest curiosity was the Italian garden with its evergreens neatly cut into fantastic shapes, standing like sentinels at regular intervals on the parapeted walls or terraces of the grounds.

On the whole, we know of no more interesting place in the vicinity of Boston, none where such rapid strides have been made in the acquisition of beautiful and rare things, or in the judicious planting and care of them.

In concluding their remarks on Mr. Hunnewell's place, the committee tender their thanks to him for his courtesies, and to his superintendents, Messrs. Hollis and Harris, for kind attentions.

SANFORD HOWARD.

PLYMOUTH.

Supplement to Report on Farms.

In accordance with a promise made in my last year's report, I have spent what time I have had at my disposal in visiting different parts of the county, for the purpose of becoming more intimately acquainted with its agricultural interests, in order to report any generally useful information that might be derived from an examination of the best farms in the various districts of our county.

I must confess that a limited acquaintance with the soil of Plymouth had impressed me very unfavorably as to its capacities for agricultural purposes; but a larger information has modified this opinion very considerably. It is curious to observe that the poorest portions of our county have been under cultivation for two hundred years, and the richest are still in a state of nature. Poor land is most easily cleared of its trees and underbrush, and the first settlers choose those portions which can be soonest made available; and where our fathers, a century or more ago, made their hasty homes, we still continue to struggle to live, leaving the almost inexhaustible soil of our swamps and low-lands to be redeemed by the greater skill and larger intelligence of the future.

Among the efforts to reclaim swamp land, that of Mr. Robert Perkins, of Bridgewater, seems more deserving of notice than any I have observed during the last year. He has cleared about three acres, which, in the early part of last summer, were covered with large trees and close underbrush. Now the land seems as if it may have been cultivated for years, so thoroughly is every stone, stump, and root removed. So far as clearing off the timber is concerned, no swamp could cost more per acre than this. The draining, however, was easily accomplished. I am sorry that I cannot give the exact expense—about a hundred dollars per acre, I believe. This cost may be too great; whether such labor can be accomplished for less, remains a problem for Yankee brains and Irish muscle to solve.

There is a great deficiency of good pasturage in our county, with the exception of Hull and Hingham, which are quite favored in this respect; indeed, greener fields than those among the rocky hills and valleys of Hingham are seldom seen. This fact renders cattle-feeding possible there. Many farmers, no doubt, are engaged in this business, but I have visited only two, Hon. Albert Fearing and Mr. A. C. Hersey. These gentlemen own large farms, and feeling the necessity of greater supplies of manure, each purchases between twenty and thirty bullocks, two or three years old, in the autumn, feeds out during winter all the products of the farm, hay, roots, and grain, pastures the cattle the following summer, and sells again in the fall. In order to pay, they think the cattle must double in value in one year. They are amateurs in agriculture, owning farms in the city of Boston, which, it is to be presumed, are more profitable than those in Hingham. It would doubtless be interesting to others who have to win their bread from the soil, to know how much, if any thing, the farms in the city contribute towards the support of those in the country.

I visited another farm in Hingham, which interested me much, not from its superiority to many others that I saw, but from the fact that it was won by the hardest knocks, from the most rugged nature, by the man who owns it, Mr. Charles A. Cushing; his house, barn and farm are an honor to him. During the day I spent in Hingham, by the kindness of friends, I was enabled to see more agricultural improvement than I could have seen, in the same time, in any other part of the county. It is true, much of this is what is called fancy farming, but the mission of fancy farmers is a worthy one, to make costly experiments which poor men cannot make and to adorn the earth.

The farms of the Bridgewaters present, in many places, a very good appearance from the road, but for want of exact information, I cannot speak of any one of them in detail. It is evident, however, to the casual observer, that the soil has never produced what it is capable of doing, and only awaits greater intelligence in the cultivators, to become a garden.

The farm of Mr. J. Copeland, of West Bridgewater, is remarkable for the quantity of hay it produces, about one hundred tons annually.

Mr. Nahum Snell's farm is beautifully located, with one of the finest and most picturesque meadows fringed with trees and shrubs, that I have ever seen. While the farms of Thomas Ames, and of the brothers Jonathan and Eldridge Howard of West Bridgewater, show good cultivation, and are well worthy of a visit. Mr. Ames's crop of barley this year, and the rye of the Messrs. Howard, show what can be done at a profit in Plymouth County.

I never pass the farm of Mr. A. Covington, of Middleborough, without stopping to admire its fine appearance. It is disfigured by no barren spots, no rocks nor stones. The surface is sufficiently undulating to give it variety, and to drain off all superfluous water. All the fences and buildings are in good order; the cattle and sheep in fine condition, and the crops must be abundant.

I am more particularly acquainted with the agriculture of Plymouth, and the more I know of it the sadder I become. Nature was not prodigal towards us in the beginning, and two hundred years of unintelligent cultivation have reduced the soil to unproductive sand. Our fields are brown when they ought to be green, fit only, it seems to me, for sheep pastures. Yet, in the midst of this general desolation, there are some indications of improvement. Many of us have become aware of our deficiencies, and a very few have set about correcting mistakes. Among those who have taken a step forward, I know none more worthy of success than the brothers Wm. S. and J. Hadaway, of Chiltonville. These two young men, without any other capital than a few worn out acres of land and the tough muscles and active brains with which nature has endowed them, have struck out a path of improvement for themselves with so much vigor and economy, that a few years must place them in advance of many of the most favored cultivators of the soil. I do not wish to intimate that their farm is, at present, in a high state of cultivation; it is only remarkable when the circumstances of its owners are considered. Their experience is particularly valuable to those who live on the coast, as they have obtained almost all the manure which they have used, not from the barnyard, but from the sea. They have made themselves an excellent scow; raked the harbor for muscles; scraped the rocks for rockweed, and gathered kelp from the shore. I requested Mr. Wm. S. Hadaway to make a statement of their summer's work, which he kindly consented to do, and I think I cannot do better than give it almost entire.

"Our farm," says he, "consists of 113½ acres, 73 of which are woodland and commons, 27 pasture, 8 mowing land, 5½ tilling.

"Stock kept—1 horse, 4 cows, 1 heifer, 1 hog and 12 hens.

"Crops grown—corn, two and one-half acres; turnips, one acre; potatoes, one-half acre; barley, one-half acre; carrots, one-half acre; squashes, one-quarter acre; cabbage, and other vegetables, one-quarter acre.

"Manures used—stable, menhaden, muscles, rock-weed and salt.

"About forty tons of muscles were ploughed under, for corn, in old pasture which was very light and barren, excepting about one acre which was formerly used by the Indians, to judge from the quantity of shells. On this part the corn grew exceedingly well, and was judged to have sixty bushels shelled corn. The other part being poor land it grew slowly until the roots found the muscles, when it changed color and grew remarkably well, but, owing to early frosts, did not do well. The whole piece gave one hundred bushels sound corn, and twenty bushels soft. For the turnips, twelve tons of rock-weed were ploughed under; the crop amounted to two hundred and twenty-five bushels. I consider fifty tons of rock-weed necessary to secure a good crop from an acre. I intended to use that amount, but the severe storms in June damaged our scow, and made us late in using our small quantity.

"The barley and potatoes were manured with twenty loads of barnyard manure and five bushels of oily salt. The potatoes measured one hundred and thirty bushels. They were planted in drills, and those that were planted the deepest were freest from rot. The barley yielded about ten bushels, but was quite salt—so much so, that when made into bread, it was quite unpalatable. Perhaps others have noticed the same results, but it is a singular fact to me.

"The carrots were manured with menhaden and barn manure, but did not come up well—yielded three tons, with twenty-five bushels turnips and ten bushels beets, where the carrots missed.

"The squashes were manured with menhaden and barn manure—yielded three tons, with forty bushels turnips between the rows. I used the shell fish known as horse-shoes, to repel bugs—put four around each hill, and we had no trouble with the bugs.

"For cabbages, I used menhaden and salt, but I cannot tell how many I obtained. They were remarkably large.

"I have raised some broccoli and Brussels sprouts; the latter I would not recommend, as they take up too much room for their quality.

"I have raised, also, some Kohl rabi, but do not think this vegetable fit for human food, but it will do very well for cattle. It will keep longer, I think, than any other vegetable.

"I have tried muscles for beets and beans—the beets grew to a monstrous size, but the beans did not do very well. I have tried rock-weed and Irish moss for grass; the former gave very good crops; the latter did not do much. I have seen the good effects of rock-weed on grass for three years. I think menhaden mixed with muck a very valuable manure; but for heavy land I prefer fish separately. I value sea-trash in proportion to the rock-weed it contains. I mix it with barn manure. I think it might be used profitably, if we had large, flat-bottomed boats to bring it from the Gurnet. It seems to me that it is not worth one dollar a ton, but I believe it can be brought here at a profit to the farmer and carrier."

Farmers on the seaboard have many advantages over those in the interior, and it is very surprising that these advantages have not, till recently, been generally recognized by those, even, whose farms run down to the water's edge. A greater activity, however, can be observed every year in carefully collecting what the sea throws on the shore; but there are other resources which have not yet been turned to account. No farmers along the coast show more zeal in the use of sea-manure than those of Manomet Ponds, a district which occupies a space about two miles square, all of which is under fence. This area is divided into small farms, owned by men whose forefathers, in the times of the earliest settlers, cultivated the same soil. They are a pains-taking, economical, thrifty race of farmers, who are always sure to reap where they have sown, because they never sow more than they can take good care of. Their crops are not various—almost confined to grass and corn. It is for their cultivation of the latter, I think they deserve special credit. They apply kelp in the fall to land that has been in grass for some years, and plough it under in the spring. The corn is planted in hills three and a half to four feet apart, cultivated and hoed thoroughly, and the yield varies from forty to seventy bushels per acre. Mr. Truman Holmes seems to enjoy the reputation of generally having the best field of corn. I visited him in September, and saw a fine field, which, it was thought, would yield seventy bushels to the acre. He says about one hundred and twenty horse-loads of kelp must be applied, in order to get seventy bushels to the acre.

There is a small meadow in the town of Sandwich, in which I have been very much interested this season, having visited it three times. The product of this field is so enormous, that I should hesitate to state it, if I had not, in company with the president of the society, had the account confirmed by various disinterested persons who live in the immediate vicinity, and seem to be well acquainted with the facts of the case. The field is owned by Mr. William E. Boyden, and consists of four acres of low land, adjoining salt marsh, surface drained, and is always kept in the most productive condition by the most liberal application of manure. Mr. Boyden keeps a livery stable, containing, sometimes, fifteen horses, together with those of transient customers. All the manure of this stable, for a series of years, has been applied to this meadow. The man who has carted it out told me it generally amounted to about one hundred and twenty-five horse-loads. It must be remembered, this is unmixed manure, from corn-fed animals. The manure is applied, I believe, twice in the season—in November, and just after the first mowing. Of course the crop of hay, after such a dressing, must be large. It is well known to his neighbors, that Mr. Boyden purchases no hay except a little salt hay for his sheep. The manner of ascertaining the amount of the crop, it must be confessed, is not entirely satisfactory. Three or four loads are weighed, and the rest estimated. I visited Sandwich just after the first mowing, this season, and was informed by Mr. Boyden that the crop of hay amounted to twenty-five tons, a statement which was confirmed, with very little variation, by all who were concerned in getting in the hay. Before the second crop was cut, twelve tons were expected, but upon my third visit, I learned that it was only seven, a report that pleased me very much, for I was really afraid to have it any more. This is not the produce of one remarkable season; I have every reason to believe that about thirty-two tons of hay, for a series of years, have been cut from this meadow of four acres.

CHARLES BURTON.

RECLAIMED MEADOWS.

ESSEX.

From the Report of the Committee.

Leverett Bradley, of Methuen, having entered the only claim for premium, three of your committee—Messrs. Stevens, Swan and Keely—viewed his meadow on the 11th of July. We found it to be a continuation of the same tract of meadow for the reclaiming of which Mr. Bradley received the first premium of this society in 1848. That part was on the river side of the highway; this is on the opposite side, and lies quite near to the now venerable mansion in which he resides.

By about one hundred and fifty rods of ditching, done in the spring of 1858, the water was brought down from the meadow to the main ditch of the lower meadow, and passed off to the river. It was in this lower ditch that Mr. Bradley, by the work of a few minutes only, dammed the water so effectually as to irrigate the whole meadow, during the drought of last spring, to the manifest benefit of the crop.

Mr. Bradley's mode of operating, was to cut with axes the surface of the meadow into strips about a foot wide, and then to follow with heavy picks, rolling up the strip with all it contained; thus peeling the whole meadow of its surface, not excepting even the stumps. When the fire had reduced all this amount of rubbish to ashes, there was left for cultivation a new surface of the richest material, free from all obstructions.

It will be seen by the statement, that while the shallow part was ploughed with oxen, (at the close of last November,) the deep part was ploughed with a horse. In answer to our inquiries on this point, Mr. Bradley showed us some fixtures answering somewhat the same purpose as snow-shoes, which were securely strapped on to each foot of the horse, enabling him to draw heavily, where oxen, at that time, would have sunk into the soft soil.

As we walked over the dry soil, covered with a most luxuriant crop, it really seemed almost fabulous, that so recently it could have been the thick, tangled, wooded morass—ten cords per acre—that it was described to be, and just such as we saw on the other side of the fence.

It will be seen that the whole was accomplished by manual labor. Ordinarily this mode of operating might have proved too expensive. But Mr. Bradley showed his tact by striking at the right time; thus benefiting the laborers, by giving them employment when they were suffering for want of it, and accomplishing a difficult undertaking when the low price of labor actually left a large margin for profit. Mr. Bradley estimates the whole expense at seventy-five dollars per acre.

If we may be excused for stepping aside from our specific duty, we would state, that as we passed through Mr. Bradley's premises, we were much pleased with his singularly judicious arrangements for making manure. The rich muck from his meadow in a dry state, is carted less than one-eighth of a mile up an ascent so easy, that a pair of oxen could draw a cart full. It is thrown into his slaughter yard, and mixed with the offal of a large butchering establishment, absorbing the effluvia so entirely as to prevent all unpleasant smell. It is then removed to form a bank, protected from the wind and sun by a high close board fence on one side, and a row of shade trees overhanging. His men were then shovelling over more than two hundred cords of such manure as a poor farmer might almost be forgiven for coveting. In passing, we would commend Mr. Bradley's manure-making establishment to the attention of your committee on manures.

We recommend that Mr. Bradley receive your first preimum of fifteen dollars.

JOHN KEELY.

Statement of Leverett Bradley.

The meadow that I offer for premium contains about eight acres. In the winter of 1857–8, I cut the wood and bushes, paying one dollar per cord, including the cutting of the bushes. It averaged ten cords to the acre. Early in the spring of 1858, before the frost was out of the meadow, the wood was drawn off and the bushes burnt. The deep part of the meadow averages eight feet; but in some places we have thrust a pole eighteen feet into the muck. This part was thoroughly drained by open ditches six feet deep, five and a half feet wide at the surface, sloping to the bottom. The other part, averaging about two and a half feet deep, was also drained by similar ditches, but smaller. I paid for the ditching from twenty-five to thirty cents per rod. The muck taken out was mostly carted to the yards.

I had no intention of reclaiming this meadow until the 15th of May. At that time the manufacturing business was nearly suspended in the neighboring city of Lawrence. At the corners of the streets stood anxious groups of laborers wishing for work. I put up a notice that twenty-five able-bodied men were wanted to work on the Bradley farm. The next morning came scores. I picked out fifty stout, hardy men, and marched them to the field of action, where we won one of the hardest fought battles of a similar nature in Essex County. The contest ended Saturday night, July 3d.

The deep part of the meadow, containing four acres, was completely peeled. The rind, consisting of stumps, roots, moss, vegetable matter, &c., was piled up and burnt. The other part also, containing four acres, together with four acres of upland adjoining, was grubbed, making in all twelve acres—all of which was peeled and grubbed or ploughed, entirely by manual labor.

The deep part of the meadow was planted with potatoes, putting the ashes into the hills. The other part with the upland was planted with squashes, putting the ashes into the hills—planting done the last week in June. Probably there was never seen a more luxuriant growth of vines in Essex County. But the early frost in August nearly destroyed both potatoes and squash vines. The warm weather following immediately after, so far revived them as that they averaged half a crop.

In 1859, the deep part of the meadow was planted with potatoes, with no manure, yielding about two hundred bushels per acre. The other part of the meadow with the upland was planted with corn, also without manure. Both parts were planted the last of May. The crop of corn was good for the season.

In the latter part of November the whole was ploughed; the deep part with a horse, the other with oxen, and all sown with winter rye and grass seed, except about three-fourths of an acre of deep part of meadow.

The present year, 1860, the three-fourths acre, and also a small piece adjoining, where the muck had all been carted off, were planted with potatoes. The latter piece was slightly manured. Judging from what have been dug, there will be two hundred bushels on the three-fourths acre, and about two-thirds of that yield on the other piece.

The winter rye sown in November, peeped out with the young blades of grass. In the spring the plants looked well until the heaving frost threw them out. I immediately passed a stone roller over the whole, and filled the ditches with water by damming below. Whether or not this was of service, you can judge by your own observation.

The rye was gathered in good order. Judging from what I have threshed, the average yield would be twenty-two or twenty-three bushels per acre. Some acres yield thirty bushels or more.

My men are now cutting half a ton per acre where the rye grew.

Methuen, September 26, 1860.

PLYMOUTH.

Statement of Josiah L. Bassett.

The land I have entered for the society's premium, before operating upon it, was lowish, moist land. The lowest, before being drained, was so cold and wet as to be almost worthless. The mud was from one foot to three feet deep. Portions of it were covered with bushes,—the high part with laurel and alder, and the lowest with alder and whortleberry, some maple and birch trees, and some pine stumps of an old growth. The bushes and trees were cut in the fall of 1857, and burned on the ground. One acre and two rods were worked and sowed to grass in the fall of 1858, and all the pine stumps that were in sight were taken out of the whole lot that has since been cleared. In 1859 I worked and sowed one acre and forty-eight rods, and the present season have worked and sowed to grass three acres and one hundred and twenty rods—making in all six acres and ten rods of land.

This piece of land is what I should call broken, some of it high enough to plough, and some with a deep surface of mud. The part that was high enough to plough cost, by estimate, ready to receive the manure, twenty dollars per acre; and that part covered with roots and mud, I estimate at fifty dollars per acre. There has been a large amount of roots and turf burned, the ashes spread upon the same; about thirty loads of good compost manure to the acre, and one bag of Peruvian guano. The compost manure, with the guano, I call worth twenty-five dollars per acre. The ashes made of the burned stuff is a first rate manure for grass, which is reckoned with the expense of clearing. The cost of ditching is well paid by the mud taken from the ditches. The time of working this land has been mostly in the months of June and August. I have estimated that I cut from two to two and a half tons to the acre on what has been mown.

Statement of C. G. Davis, of Plymouth.

During the last four years I have been making the best part of my farm, from land which was dead swamp in 1856. I commenced with the slope extending from the northerly bank fronting Eel Creek, and extending across the railroad, then turning and running southerly on a line with the harbor. This land contains about two and a half acres which was swamp, and about two acres more which I have underdrained, and which was always wet until June, giving no signs of a grass crop until late in that month. It is all upon a declivity, out of which above, and down the descent, springs burst out. It was covered with dock, skunks cabbage, alder, and swamp bushes, and was unsafe for cattle. In August, 1856, I cut drains through the black mud at intervals not more than thirty to forty feet apart down the descent, occasionally making a short branch to lead in a spring. In a few weeks the mud was sufficiently dried to allow me to dig deeper into a soil which varied from clay to gravel and fine quicksand. I dug another drain the whole length under the bank, affording sufficient slope to carry off the water both ways. I laid the bottom with strips of old boards, and placed broken rails parallel with each other upon the boards—upon these I laid the larger stones, filled in with small stones to within eight inches of the surface—covered with sea-weed from the shore, and finished with sand and gravel. This land was so soft that I did not venture, with the knowledge I then had, to use tiles, and I still doubt, whether they will serve upon land so soft as this then was. I covered the whole land during the winter from a sand bank close by, from four to eight inches in depth. In one place, however, I was obliged to "drown out" the spring by the use of sand. I could not open the mud long enough to make a drain. It would be impossible for me to state with accuracy the cost of this improvement. Done at odd hours, mostly in the fall and winter, no account could be kept of it. The time lost in gathering stones, and placing them in the drain, far exceeds the cost of tiles laid, and was no small item. Some of these stones, however, were raked from stubble land, or lay in heaps where they were a nuisance and must be removed. This, however, I can say; the land is clear gain, as it was worthless before, and the labor was performed when, with hired men, little else could be done on cleared land. I find I can do a great deal of draining in the winter, much more than one would at first suppose. Such land is generally open, and free from frost, except upon the surface. And the covering and filling in can be best done when the weak places are frozen over, provided your land is free from rose bushes, or such other plants as are likely to push through your covering. In the spring a portion of this land was covered by scraping down the brow of the bank above, which was formerly too steep for a hay cart, thus filling in over the drain under the bank some two or three feet more.

And now for the result. This land was laid down to clover, herds-grass and Timothy, in the spring of 1857, and a portion in the spring of 1858 with barn compost harrowed in, and has been in English grass ever since. The crop has been very heavy, and in 1859 had the finest show of Timothy which I have ever seen. It came up and overtopped the herds-grass after it had flowered, changing the whole appearance of the field. I have mowed it twice every season, and the first crop is more than can be made upon the ground.

But how about the stone drains? From my own experience I should advise no man to make covered small stone drains under any circumstances. My greatest trouble is with the moles or field mice, who bore holes innumerable down into the drains, which work the speedy destruction of the drains after a few surface washings. No drain should admit a particle of water from the surface. By great care and attention two only of my drains have as yet become obstructed and overflowed, and in these, or rather near these and in their stead, I shall now use tiles. On a portion of the drained land where there was no swamp, and the drain was cut through clay pan, I have seen no mole holes, either in the grass or the cultivated land; and on this portion I raised fodder-corn the year after draining, where a cow would formerly mire at every step. The corn was planted in June, and was tasseled when the frost took it.

During the last two years I have subdued another piece of clean swamp. The whole lot consists of about four acres. This was covered in August, 1858, with swamp whortleberry, briers, rose bushes, high bush blackberry, and "black pepper," upon a peat running from two to twelve feet deep, and overflowed by springs, from which, through its centre, flowed a sluggish brook. In August, 1859, I cut off all the brush with the axe and stub-scythe, and cleared off all of what was before impenetrable except by an occasional cow path. I deepened the outlet two feet through a bank of gravel and pan, about two hundred feet in length—dug a new ditch parallel with or straightening the old brook, and leaving its former bed on dry land. This ditch is almost three hundred feet long, and after digging two central ditches about one hundred and ninety feet each, the land was left for another year. In August, 1859, dug ditches around the whole of three sides and commenced on the southerly end of the swamp by paring the whole surface with bog-hoes. The roots, though the stumps are from one to three inches in diameter, seldom sink more than three inches; and the bog-hoe, with a narrow axe on one side and the adze at the other, takes up sods two to three feet square. These were carted to a knoll of about one-quarter of an acre until it was covered, and the balance was disposed of during the winter, as follows: We dug pits occasionally, the whole depth of the peat, from nine to twelve feet, and into these the roots and sods are dumped—as the cart goes to the swamp in the morning and at noon, it carries a load of manure, returning with a load of peat at noon and night. The manure is composted with the heaps of peat, and when the whole meadow has been covered with gravel, the compost heaps are all ready in the spring to spread upon the meadow. In this manner I made an acre and a half of meadow last winter. On about six rods square of the meadow, the sods which were free from roots were turned, and the surface shingled with them, and the root-sods removed. All the ditches being made in solid peat, were flared some eight feet from the upper edge of each bank, by removing the peat eight feet in width and almost three feet deep, and dumping gravel into the angles on either side, mixed with a surface of soil or peat, thus making a natural slope with no perpendicular sides for sun and frost to act upon. The north or east side of all open ditches should be well flared, for in our climate the sun thaws almost every day the side of the ditch which is exposed to its rays.

In April all the manure being upon the ground, I laid down an acre with herds-grass, Timothy, clover, orchard grass and oats, two bushels and a half of the latter, and in July mowed the oats. They were drawn to a field near the barn, and stacked. Here they remained until the first week in October, when they were threshed with a machine. They threshed sixty-four bushels of thirty-four pounds per bushel, making sixty-eight bushels of thirty-two pounds. In addition to this, I have no doubt I lost four bushels by the hens, not counting what I lost by mowing, raking and carting. In September I mowed the grass crop, principally clover, and got 2,200, weighed as it went into the barn.

Upon a quarter of an acre I sowed Hungarian grass June 10, cropped it August 20, and laid it down immediately to grass. The Hungarian grass was not weighed, but was estimated at half a ton. Another quarter of an acre was drained by running three hundred feet of tile drain under the bank at the edge of the peat, cutting through it about a foot into the solid clay pan two feet more. Upon this portion I cut out the bushes and meadow roots, and have left it to grass. The cost of this work, also, it is impossible for me to estimate accurately. Besides the peat which was carried to the barn, I covered during the winter an acre of flat old pasture land adjoining, with one hundred and twenty-eight horse-cart loads, and filled the holes with sods and gravel. The roots upon the sandy knoll were burned in March, and the ashes ploughed in upon the knoll, and the pasture land around it. This I laid down on the 10th of June with lucerne and barley, and mowed both for hay, August 20. The lucerne was fifteen to twenty inches high, and as the land is cleaned, I expect to mow it for fodder four times a year for the next dozen years. I think what I have done has cost me one hundred and fifty days' work, but at that price, it being well done, I consider this land, which was before entirely worthless, the best land I have got, probably as good for grass, our great staple, as any land in the county.

Upon peat meadows like this, permit me to say that I deem open drains, well made, far better than any system of underdraining. No close drains, it seems to me, could last two years—not only the muddy deposit of the peat, but the settling, and unequal texture of the peat would destroy them. Nor do open drains upon such swamps furnish the objection that the meadow is cut up into small lands, which is well taken in cases where there are frequent springs, and the drains must be frequent also, as is the case with the land I first drained. Much of our flat peat meadows are furnished by springs above them, on another's land, or by the springs and surface water from the adjoining highlands; and if the drains are deep enough, and judiciously located, there are few places where the lands may not comprise more than a third of an acre. A land so small is no great hinderance to a man who means to cut three or four tons to an acre, upon which the hoof of his neat stock should never travel.

Statement of Austin J. Roberts.

In the year 1856, I made an entry with Mr. Howland, the supervisor for our society, for an improvement contemplated on swamp lands; the award of the premium to be made in 1860. The meadows in question proposed for improvement, of which there were several distinct pieces, consisted of extremely low, wet bogs overflown by adjacent ponds in the winter, and at all other times and seasons impassable to cattle.

One swamp was covered densely over with bushes; the other two meadows were clear, yielding rushes and other coarse bedding material.

Believing it "would pay," not only in genuine satisfaction, but lucratively—dollars and cents considered—to reclaim these waste places, more especially as two of the swamps adjoined my garden and ornamental grounds, I commenced with Portuguese laborers, hired at from four dollars to six dollars per month, in the autumn of 1856, and have continued at intervals the work of redemption up to the present time. The labor has consisted simply in forming "terra firma" where before there was none; or, in other words, making land where there was only soft mud. This was accomplished by carting adjacent hills of gravel upon the swamps, and gradually raising the surface of the low lands above high water, much in the same way as wharves are built in cities. The amount of gravel carried upon an acre has been about one thousand loads, after which a thorough top covering (not dressing) of rich loam from the forest and meadows, composted with horse manure, was applied. The result is "big returns" in the shape of heavy semi-annual dividends of grass. The whole expense of the improvement is slightly under one hundred dollars per acre; still, it pays well; the average value of hay cut being forty dollars to the acre, or three tons, at about thirteen dollars per ton.

IMPROVING PASTURE AND WASTE LANDS.

ESSEX.

Statement of Jonas Holt.

The piece of land which I present for premium contains about three acres within its walls; about one acre and three-fourths was ploughed in 1813, not having had much done to it since, it was almost covered with brakes and bushes.

The other acre and one-fourth was partly run and partly swale land, the run and swale were both very wet, the part that had been ploughed was partly a gravelly soil and partly a stiff loam resting upon a hard pan. My first object was to get rid of the water; for this purpose I cut a ditch through the centre of the run twenty-one rods, three feet wide, and two feet six inches deep; there was so much water at the time that it was very slow digging. This ditch cost me forty cents per rod. In the bottom of this ditch I laid a good stone drain, and then filled the ditch with small stones. I then dug five short ditches on the sides of this main ditch to drain the land on the east and west sides, running nearly at right angles with and emptying into the main ditch. In these short ditches I laid stone drains and covered them deep enough to plough over; the result was, the land is all dry enough to plough; the short drains however were not dug until after the land was ploughed. As this piece of land was considered of little value, I determined to try what deep ploughing and thorough cultivation would do; the land was not considered worth more than twenty dollars per acre when I commenced on it, and now I think it is worth sixty or seventy dollars per acre, and will pay the interest on it, and more too.

A statement of the cost and the amount of crop, with its value, is herewith annexed.

1858.		
Nov.	Twenty-one rods of ditch at forty cents per rod,	$8 40
	To laying drain and filling the same, . .	5 00
	To ploughing, one day, with eight oxen and four hands, ...	12 00
	Use of plough, ...	75
		$26 15

1859.		
May.	2 days' ploughing with six oxen and three hands,	$8 00
	Use of plough, ...	1 00
	Harrowing, ...	2 00
	Thirty loads of manure, ...	15 00
	Planting and seed, ...	12 00
	Hoeing once, ...	6 00
	Harvesting, ...	4 00
Sept.	20 rods of underdrain, at forty cents per rod,	8 00
		$56 00
	Credit by 80 bushels of potatoes at fifty cents,	$40 00
	20 bushels corn, at one dollar, .	20 00
	60 bushels turnips, at twenty cents,	12 00
	4 bushels tomatoes, at forty cents,	1 60
		$73 60
	Expense, ...	$82 15
	Value of crop, ...	73 60
		$8 55
1859.		
Oct.	To digging and filling sixteen rods of ditch, .	$8 00
	Ploughing, 3 days, with 1 pair oxen and 1 hand,	7 00
	Use of plough, ...	1 20
		$16 20
Total expense up to December 1, 1859, . . .		$98 35
Income to the same date, ...		73 60
Leaving the land in debt to me, ...		$24 75
To this add the interest on the land at $20 per acre, $3.60, will leave the balance against the land,		$25 35
1860.		
May.	To 12 rods of ditch dug and filled, . .	$6 00
	ploughing and harrowing, . . .	8 00
	planting and seed, ...	12 00
	hoeing, three times, ...	15 00
	cutting, binding and carrying stalks, .	2 50
	70 loads of manure, half its value, . .	35 00
		$103 85

Credit for the present year, 4 bushels of pease, .	$4 00
43 bushels Chenango potatoes, at 50 cts.,	21 50
30 " St. Helena potatoes, at 45 cts.,	13 50
20 " Davis seedling potatoes, 45 cts.,	9 00
28 " Bradstreet potatoes, at 45 cts.,	12 60
8 " Tomatoes, at 50 cts., . .	4 00
1 " Beans, at $1, ...	1 00
300 " bundles of stalks, . . .	6 00
120 baskets of corn, ...	60 00
6 " soft corn;	1 00
1,000 Cabbages, at 4 cts., ...	40 00
	$172 60
Deduct expenses, ...	103 85
	$68 75
Deduct one day's work ploughing in May, . .	8 00
	$60 75

I then have a clear gain of $60.75, besides the extra value of the land. You will see that I have charged nothing for harvesting the corn; I thought the butts worth enough to pay for harvesting, so I gave no credit for the corn fodder and charged nothing for the harvesting. I ploughed this piece of ground ten inches deep, and turned up so much of the cold subsoil that I think my first crop was not as good as it would have been had I ploughed shallower, but I am satisfied the land for after crops, will amply pay for the meagre crop I got at first.

You will see that I have charged but half the worth of the manure, as I calculate one-half of the value of the manure should be charged to the land and one-half to the crop.

ANDOVER, November 8, 1860.

Statement of Paul T. Winkley.

The piece of waste land which I offer for the inspection and consideration of the committee, contains about fifteen acres. It was worthless before I commenced improving it, because it did not produce any thing of any value. It was covered with bushes and moss, such as wild rose bushes, iron bushes, bay-berry bushes, &c. Some of the bushes we cut and burned on the ground and some we ploughed in. The soil is a clay loam. We ploughed about eight acres of it in the summer of 1857, in wet weather when we could not do any thing else to advantage. Thus ploughing in all that was green to decompose previous to ploughing in the following spring when it was cross-ploughed, and about six acres of it manured with as much manure as could be ploughed in. The remainder was ploughed and harrowed, and not planted, as I do not think that it pays to plant and hoe without manure. All that was manured was planted to corn, but on account of the wet and cold weather it was not planted until the 5th and 6th of June, hence it was not very sound corn. In 1859 that which had been planted to corn was sowed to barley and grass seed, and it was a good crop. This year we have cut two large crops of clover and Timothy.

In the summer of 1858 the remainder was ploughed, and last year (1859) it was manured, ploughed, and planted to corn and ruta-baga. The corn did not get ripe and not a very good crop. The ruta-bagas were a fair crop. This year five acres of it were sown with six bushels of wheat and grass seed, and four acres to barley and grass seed. The wheat produced ninety bushels, the barley one hundred bushels.

I have put on the whole piece one thousand loads of stable and barnyard manure, half a cord to the load which I charge to the land, $2,000. The crops which I have received I calculate will pay the expense of cultivating and applying the manure, so that the land is now indebted to me $2,000.

This I expect to receive back again principal and interest in five years in hay and fall feed, so that I shall gain by the operation at the end of eight years the value of the land, which will be at least one hundred dollars per acre.

NEWBURYPORT, November 1, 1860.

NORFOLK.

Statement of A. L. Smith.

The piece of pasture land which I offer for premium, contains four acres; the soil is a gravelly loam. It had been used for a pasture for nearly a hundred years, and a great part of it was covered with whortle and blueberry bushes, ground savin, and a small piece with alders. In August, 1858, I mowed the bushes and burned them upon the ground. The following month I ploughed two acres of the piece with four oxen, then harrowed thoroughly and sowed with rye. In April, 1859, I ploughed the remaining two acres, one and three-quarters of it with four oxen, the other quarter, where the alders grew, with six oxen. Then harrowed, furrowed, and applied three cords per acre of coarse, strawy manure in the hill, and planted the piece with potatoes, hoed them once, and produced a fair crop of good, sound potatoes. The rye on a part of the field was quite good, and the remainder very slim. In April, 1860, I ploughed the part on which the rye grew last season, across the old furrows, then harrowed it well. In May I ploughed the other two acres, and harrowed the parts on which bushes had grown; then raked up several loads of roots, burned them, and spread the ashes upon the ground. The last part of the month I planted three acres of the piece with corn, applying three cords of good compost manure per acre in the hill. The remaining acre was planted with potatoes, manured with about three cords of strawy manure in the hill. As there were but few weeds to contend with, I hoed the corn and potatoes but once. In each alternate row I planted pumpkin seeds, and where the crows pulled up some hills of corn at one corner of the field, planted pickle seeds. The corn was very good, with but little soft corn. To ascertain the amount of fodder upon the piece, I weighed an average rod of the husks and stalks, after they were well dried. The cost of husking the corn was of small amount, as I had a husking bee to husk part of it, and the remainder was all husked evenings, except one stormy day.

The expenses were as follows :—

1858.	
To mowing bushes,	$5 00
ploughing, 3 days,	11 25
harrowing, 2 days,	4 00
4 bushels rye, and sowing,	4 50

1859.

To ploughing $1\frac{3}{4}$ acres with 4 oxen, ...	$6 56
ploughing $\frac{1}{4}$ acre with 6 oxen, $\frac{1}{2}$ day, . . .	2 87
boy and oxen $1\frac{1}{4}$ days, harrowing, . . .	2 18
furrowing, $1 ; 20 bushels seed potatoes, $10, .	11 00
6 cords manure, applying manure and planting, .	32 00
ploughing and hoeing, $7 ; harvesting potatoes, $6,	13 00
cradling rye and binding, $3 ; threshing, $2, .	5 00
carting straw, ...	2 50

1860.

To ploughing 4 acres, $9 ; harrowing 3 acres, $4, .	$13 00
raking and burning roots, $1 ; furrowing, $2, .	3 00
nine cords compost manure, $45 ; 3 cords strawy manure, $10.50, ...	55 50
applying manure and planting, $20.25 ; seed corn, $1.08, ...	21 33
10 bushels potatoes, $5 ; pumpkin and pickle seeds, 25 cts., ...	5 25
cultivating and hoeing, ...	11 37
cutting stalks and harvesting corn, . . .	10 95
harvesting potatoes, ...	4 25
Total amount of expense, . . .	$224 31

The value of the crops is as follows:—

1859.

By 19 bushels rye, ...	$19 00
1,550 pounds straw, sold at 80 cts. per hundred, .	12 40
144 bushels large potatoes, at 50 cts., . . .	72 00
18 bushels small potatoes, at 25 cts., . . .	4 50

1860.

By 120 bushels corn, ...	$120 00
12 bushels pig corn, ...	2 40
4 tons husks and butts, ...	28 00
4,800 pounds stalks, ...	24 00
83 bushels large potatoes, at 40 cts., . . .	33 20
10 bushels small potatoes, at 20 cts., . . .	2 00

By 2 loads pumpkins,	$3 00
pickles,	1 25
Total,	$321 75
Deduct expenses,	224 31
Leaves a profit of	$97 44

DOVER, November 14, 1860.

From the Report of the Committee on Clearing Unimproved Land.

The committee report that only one claim was made upon them this year. They regret this fact, for they know that more or less land is cleared and subdued every year in this county, and the owners are entitled to recognition and reward at the hands of the society. The object of the Society in rewarding the efforts of the farmer is partially defeated if there be but one applicant for each premium. The object is not to induce the one farmer to come forward and receive his premium for one piece of work done, perhaps without regard to cost, but to cause all who have done the same work to invite the committee to examine the case and award a premium to him who has done the best work in the most economical and profitable manner. In the one case the society encourages a wasteful application of money and labor to rough lands, in the other it encourages a display of sound judgment and good management. It is to be hoped that another year may find this fact more fully impressed upon the farmers of our county, and that the committee of next year may find enough to do. The importance of these visits is acknowledged quite universally, but still not with that depth of conviction which the committee think it deserves. The views of members from various parts of the county, and their different systems of management, and their differing opinions as to the system adopted by the farmer on whose ground they are, are all discussed earnestly, and every one present is satisfied that he has learned something, and made a stride in the march of improvement. This was the case in our recent meeting on the farm of Mr. John Sias, in Milton; we all came away with the determination to do some things which Mr. Sias does, and which we have not done heretofore. Any one visiting this farm will be struck with the judgment displayed throughout the whole management, and here will be found an exception to the general rule stated above, that when but one application was made for a premium the advantage of competition was lost. Mr. Sias is not disposed to subdue a piece of pasture for the fun of it—as may be easily supposed, when we are told that two men and two yoke of oxen were three days in ploughing one acre after it had been cleared and burnt over, and a great many stones removed, Mr. Sias putting "his own shoulder to the wheel." His object was profit. His farm is less than twenty acres, and needing pasture for only one cow, he concluded to improve about one-half of his pasture, and then he would have no waste land, and every acre would do its duty towards earning subsistence for the family. The improved lot contains about three acres; it has a depression across the middle of it, consequently one-half of it slopes to the north, and the other half more gradually slopes to the south. A covered ditch is to be made through the hollow to drain one corner, which is very springy. The one acre, so hard to plough, produced eighty-three bushels of corn for its first crop. The land is naturally good, and, under Mr. Sias' management, will not produce less and less each year, as is too commonly the case with improved lands. His system is to make his land better each year, and we wish all who have any doubts as to the profits of that plan, and all who think their farms cannot be so managed, would go and see Mr. Sias, and their eyes will be opened.

Below will be found the statement of John Sias, and we cheerfully award him the first premium of eight dollars.

M. B. Inches, *Chairman.*

Dedham, December 1, 1860.

Statement of John Sias.

Gentlemen,—The lot of land which I offer for a premium contains about three acres, covered partly with red cedars and small bushes, and was very rocky and stony. One great object in attempting to reclaim it was to obtain the small stones to bed a road which I contemplated making, and which I could not obtain so easily from any other place; it had never been used except as a pasture, and had never been ploughed.

In the spring of 1859 I cut the wood and bushes from two acres, ploughed it, dug and carted off a part of the rocks and stones, burnt the bushes, carted on about six cords of manure, and planted with corn, potatoes and cabbage; the ground was rough, and it was rather a poor crop.

In the fall of 1859 the other acre was cleared, the bushes were burnt, and the ashes spread over the ground and ploughed in, the stones were carted off, in part, and in the spring of 1860 it was cross-ploughed, the roots dug up and burnt, and the ashes spread over the lot, then manured with five cords of manure, and planted with corn.

The two acre lot was planted the present year, after spreading about eight and a half cords of manure, with pease, pickles, sweet corn and cabbage, with ruta-baga as a second crop after the pease. We have kept no particular account of the work done upon the piece in carting off the small stones, but some idea of the quantity may be formed when I state that a road has been bedded with them nearly forty rods long, twelve feet wide, and one and a half feet deep. A well twenty-five feet deep was stoned with them, and the backing for a cellar wall one hundred and thirty feet long, and equal to one foot by one and a half deep and wide. Also a trench for a wall across the lot and for underdraining, about twenty-two rods long and two and a half feet deep and wide; and in addition to the above, a man, with a yoke of oxen, carted three days, and a considerable quantity are yet left upon the ground. No charge has been made for any of the above work, as the stones were wanted, and were worth the cost of picking and carting.

The digging of part of the above, and also the digging and hauling of large ones sufficient to build a heavy wall of about twenty-two rods across the lot, twelve of which have already been laid up, have been charged to the lot, and there are now on the ground enough large ones to build from twelve to fifteen rods more.

The expense of clearing, cultivating, and inclosing the lot, has been as follows:—

The work upon the two acre lot in the spring and summer of 1859, was	$70 00	
Six cords of manure,	36 00	
1860, labor through the season,	82 00	
8½ cords of manure,	51 00	
		$239 00
Expense of the one acre lot:—		
1859, work, ploughing and digging rocks,	$30 00	
1860, five cords of manure,	30 00	
labor through the season,	38 50	
		98 50
		$337 50
Ashes from burnt roots and brush,		10 00
		$347 50
The produce has been as follows, from the two acre lot, in 1859:—		
Corn and corn-fodder,	$64 00	
Potatoes,	8 40	
Cabbage,	30 00	
		$102 40
1860, pease, $32.25; early cabbage, $40,	$72 25	
pickles, $48.11; sweet corn, $6,	54 11	
late cabbage, $48; Savoy and red do., $12,	60 00	
ruta-baga,	33 75	
		220 11
From the one acre lot, as follows:—		
1860, corn, 83 bushels and 37 pounds,	$83 65	
4,900 pounds top stalks, at $15 per ton,	36 75	
6,000 pounds butts and husks,	22 50	
		142 90
		$465 41
Cost of clearing and cultivating,		347 50
Clear profit,		$117 91

Besides having a good handsome field for cultivation, instead of an almost worthless, rocky, and bushy pasture. Perhaps I should have mentioned that there are a few rods at one corner of the acre lot which are now in their natural state.

MILTON, November 12, 1860.

ORCHARDS.

WORCESTER NORTH.

From the Report of the Committee.

A poor tree is not worth transplanting even if obtained as a gift, while a good tree is cheap at double the price usually paid. In purchasing trees for an orchard, regard should also be had to the distance from the ground at which the lower limbs start out from the trunks. As there is no doubt that the whole ground of an orchard for some years at least after planting, if not for its whole existence, should be kept under cultivation, and as this can be done easier with the plough than the spade, it becomes necessary that the lowest branches should be out of the way of the yoke and horns of oxen, or the harness and back of the horse. For this purpose it has been found by experience that five feet from the surface of the ground is the least distance at which the limbs should be allowed to remain.

So too in orchard culture. Apple trees should be set out at least two rods apart; otherwise, when mature growth is attained, the branches of adjoining trees will interfere with each other, compelling them to tend upward for light and air, and thus subjecting the owner to the trouble and hazard of ascending lofty trees to gather his fruit.

In regard to the danger of making the apple tree grow too rapidly, particularly those varieties which are adapted to our climate, we apprehend that all fear in that respect is well-nigh groundless. The object of the orchardist should be to obtain trees large enough to produce something worth harvesting before they begin to bear fruit. What he wants in the first place is a *good-sized tree;* and there need be no fear that the Baldwin, Rhode Island Greening, Roxbury Russet, Hubbardston, Peck's Pleasant, Gravenstein, Porter, William's and such like kinds will grow too fast. The subscriber has an orchard, and there are others in this vicinity similar, the trees of which were set out only ten, eleven, or twelve years ago, and this season many of them have borne four or five barrels of large, fair fruit, and at the same time have made a growth at the end of the limbs of from one to two feet. The trunks of some of them are more than two feet in circumference, and the extremity of the branches of the few that were planted only twenty-one feet apart, already touch each other, and to the eye of the pomologist they present an appearance of healthfulness and vigor delightful to behold. The trees in this orchard were not allowed to bear fruit for the first seven or eight years after being set in the ground; the soil has been in constant cultivation with some hoed crop, receiving only a very moderate application of stable manure spread upon the surface before ploughing, together with such a quantity of muck, ashes, old plaster, bones, &c., as could be obtained without too much expense, the amount of the whole being quite small. The crops of fruit that these trees are sure to bear every year, or alternate year, will in the future retard their growth sufficiently to satisfy the most timid. Just compare such vigorous, healthy, fruit-bearing trees with thousands that may be seen any where, planted in grass ground, or checked in their growth by the borer, maintaining a feeble, sickly existence, and producing a bushel or two, perhaps, of wormy and knotted fruit, and that too quite as early as the most impatient and short-sighted might desire, and all apprehension of too rapid growth will vanish as dew before the morning sun.

C. C. Field, *Chairman.*

Statement of J. M. Sawtell.

The orchard which I offer for the society's premium, consists of fifty-six trees, of the following varieties, viz.: Minister, Foundling, Gravenstein, Porter, Sops-of-wine, Rhode Island Greening, Ladies' Sweet, Liscomb, Baldwin, Northern Spy, Mother Apple, Hubbardston Nonesuch, and some that I do not know the names of. Forty of them were set out in May, 1856, and the rest in May, 1857. I obtained them of the Shakers at Groton, at twenty-five cents each. They were two and three years from the bud. The holes in which they were set, were dug from four to five feet in diameter, and from fifteen to twenty inches deep, and thirty feet apart. The land was in sward, bearing a light crop of grass. Many places the ledge was laid bare in digging the holes. The sods were cut in pieces and returned to the holes and put about the roots with the best of the loam, the sods serving to keep the soil loose and moist about the roots. The trees made some growth the first year, and I have not lost a tree, although inexperienced in the business of setting out trees; I felt that my first attempt was quite successful, that by improving the spare moments, (as I have,) I might raise (with the blessings of God to aid me,) a nice little orchard. The first year I put about them a compost of chip-dirt, leached ashes, and some stable manure, about one-half of a wheelbarrow load to each, and stirred the soil two or three times during the season. The next year I set out the remainder and ploughed the ground, spreading a fair coat of stable manure upon the furrows, and planted it with potatoes and corn, principally potatoes. I have used leaves and leaf mould from the woods two or three times, and think it good, as it keeps the soil light and in good condition, but I have not been able to discover any great effect to the trees from its use, as I have not used it long enough to test it; but I don't see why it does not contain the natural elements of the tree, and may be well adapted to nourish and keep them thriving naturally. The trees have been washed with soft soap and water, about as thick as cream, or nearly as thick, by mixing them together, once or twice each year, and I think with good effect. I think the soap-suds that run down about the trunks of the tree have a tendency to keep away the moth of the apple tree borer. I have experimented in cutting off limbs at different times of the year, and I like June the best. At other times when cut, the wound does not heal so readily as when cut in June, but the bark turns black, and the wound is a long time healing, and in some cases has not healed yet. When in June, I have noticed that the bark keeps bright, and the wound soon heals. The borer has troubled me some, but I look after him twice each year with knife and wire, and have thus far been able to keep a little ahead of him, with one or two exceptions, when he has nearly destroyed two trees, yet they may recover in time. My aim has not been to make great growth of wood, but to keep trees in a good thriving condition, and let the wood harden, that they may withstand the severe winter weather which this climate is subject to. I have noticed that uncultivated trees bear the most regularly, but of course not as good fruit as highly cultivated ones. I have cultivated the ground with roots and tomatoes, spreading cow, horse and hog manure upon the surface. I fork up the soil in the spring and fall about the trees, and hoe about them the same as other growing crops, and let nature do the rest. I might spend more time with them, if I had it to spare, but by improving the little spare moments, I have done as well as I could; and here is the result. Almost every young man in the country may do the same, if he will but improve his leisure moments, instead of idling them away as many do. He may raise one, and as many more as he can, and thus confer great blessings upon those to come after him. Who can tell the blessings of even one single apple tree thus raised? And would it not be well to encourage every young man to do something of the kind, and thus save himself from many temptations, and perhaps much misery? Let him set out one little tree, and see what pleasure will be afforded in its cultivation. I, for one, take much, in the cultivation of mine, and wish others may do the same, and as much better as they can.

HAMPDEN.

Statement of H. M. Sessions.

The apple orchard entered for premium consists of sixty-six trees set in 1857, on about one and one-half acre of land, with eastern exposure. The varieties were the Baldwins, Greenings, Russets, Hurlbert, Danvers' Sweet, Ladies' Sweet, and Hubbardston Nonesuch. The trees were raised in my own garden, and about seven feet high when set. The ground was broken up and cleared of stone the year previous to setting the trees, it having been in pasture since the forests were cleared off, nearly fifty years ago. A liberal coating of manure was applied, and the ground thoroughly ploughed twice with a side-hill plough, and cropped with turnips. The next spring it was sowed with oats, and seeded with grass for mowing; the trees were set two rods apart each way, in holes two feet deep, and three feet in diameter. The *subsoil* was spread over the ground, and the holes filled with the *soil* and *rich loam*, carted for the purpose. The land has been in grass since the trees were set, it being liable to be washed by rains if under cultivation; a few shovelfuls of manure have been put around each tree in the fall, and spread in the spring. In trimming, care has been taken to form the head so that the limbs will not cross nor interfere with each other when loaded with fruit. The trunk is left about six feet high, so that a team can pass under without interfering with the horizontal branches; these branches at that height will touch the ground when loaded with fruit.

South Wilbraham, October, 1860.

PLOUGHING.

ESSEX.

From the Report of the Committee.

A well chosen spot was selected for ploughing, it being a rectangle, the lots well proportioned, about nine rods long by three wide, making about one-sixth of an acre, rising on either side, which gave the spectators a good opportunity of overlooking the scene. The ground was rather hard with pebble stones, which is not undesirable to try the skill of the ploughman. The premiums were well contested, and the work well done. There were seven kinds of ploughs used; but as different individuals have their preferences, the committee will not give their opinion as to their comparative value.

The committee were reminded of the importance of heavy ploughs and strong teams on hard land, as a heavy plough is much less disturbed by pebble-stones than are lighter ones; hence the reason why new ploughs make better work on hard land than old ones, because ploughs grow lighter by wear, and a strong team will make better work than a light one, as the team will pass on more steadily.

The time occupied in ploughing was from thirty-four to fifty minutes—about the same length of time as has been usually occupied in ploughing with ox teams. Possibly, however, they might have ploughed a little quicker, had it not been understood that the committee were not favorable to excessively quick ploughing. Horses will usually plough more in a given time than oxen. Every wise and judicious farmer will study the principles of economy, and profit in all the departments of farming. Hence the question often arises, which is the most profitable to perform farm work, oxen or horses; or if both are kept, how many of each? This depends upon circumstances. For ploughing and harrowing on easy land, horses will work to good advantage. Also for teaming on the road, of which almost every farmer has more or less to do, horses in most cases are preferable to oxen, as they will travel quicker, and are better able to bear the heat in warm weather. They are also better for soiling; and as most of our pastures are poor, working animals for the most part must be kept on hay and grain during the year. And further, as labor-saving machinery increases, horse labor also increases, as most of it is operated by horses, such as mowing, reaping and raking; also various kinds of implements that are used on cultivated land to save the use of the hoe. They are also used more than formerly for almost all kinds of farm culture, especially getting in hay, as they will travel much quicker, especially when returning from the barn to the field. There are various other kinds of business which are to be performed exclusively with horses.

There are also important considerations in favor of oxen. Their cost is much less than horses: the cost of harness in which to work them is also less. They are better adapted to some kinds of work, such as removing heavy stones, ploughing rough land, and performing various other kinds of heavy work; and when past labor in consequence of old age or misfortune, they are fattened and turned to the butcher, while the horse is worthless.

As it has been before said, every farmer should be governed by the circumstances in which he is placed, and not depend too much upon the example or advice of his neighbors. He should consider the labor to be performed, the means of keeping, and all the other circumstances; and then pursue such a course as wisdom directs.

JOSEPH HOWE, *Chairman.*

PLYMOUTH.

From the Report of the Committee.

Our ploughing matches are mainly practical, perhaps too much so; and we think it might be well in the future, to allow each competitor to plough the lot assigned him in his own time, and in his own way,—to make his furrows shallow or deep, to cut them wide or narrow, to leave them flat or inclined—giving him an opportunity of stating to the committee, if he chooses to do so, his reasons for preferring his peculiar method of ploughing to all others. Under our present system, the competitor, however competent he may be to decide such questions, has nothing to do with the comparative advantages of the different modes of breaking the soil. He is merely to plough a given area, to a given depth, in a given time, the conditions being previously fixed beyond his control, and the committee have only to judge of his success or failure in fulfilling these conditions; in other words, to decide as to the fitnesss of his plough, the training of his team, and the skill and efficiency manifested in holding the one and guiding the other.

The mere theorist would say that the plough of this or that particular model, having upon it this or that particular stamp or device, and made by this or that particular manufacturer, is alone reliable. The practical farmer selects that plough whose work is most satisfactorily performed in the kind of soil where it is chiefly to be used. A plough which is precisely adapted to the silex of its owner's "barn field," or to the alumina of his "nook pasture," may make but sorry work in the friable loam of the Agricultural Society's grounds. Hence, many a man, whose furrows on his own hill-sides or in his own valleys are faultless, finds his work here the subject of disparaging remark or of open ridicule, and that, too, without fault or neglect on his part.

No ploughman can make perfect work without a well-trained team; a team prompt to catch, from the slightest motion or sound, the intention and wish of the driver; a team having, as some animals seem to have, and others never have—a sort of intuitive perception of the desirableness of an even yoke or whiffle-bar; of the economy of a "bee line" in the furrow, and of the beauty of a regular curve at its ends. Our ploughing matches are, too often, a trial of the courage of a team rather than a test of its training. It is one thing for spirited animals to work well amid the familiar surroundings of the farm where they were reared. It is another and a different thing for them to do so amid the strange sights and sounds incident to a cattle-show, where all is excitement and competition—and where the completion of each furrow must be effected by dint of a desperate charge at a noisy phalanx of men and boys, who have little respect for the proprieties of the place and the occasion, and whose highest idea of a successful cattle-show seems to be realized in securing for themselves a conspicuous position, within the lines at the ploughing match, and within the railing on the horse track.

But with the ploughman rests, mainly, the question of success or failure. If he is master of his art, his work, on land free from obstructions, will be performed with but slight expenditure of muscular energy. He will not long own or drive animals which he significantly characterizes as "unfacultied," or follow a plough which he can keep in position only by walking on the unploughed sward, with his body at an angle of forty-five degrees from the perpendicular; or one whose work he is compelled to complete by dancing a hornpipe on its half-turned furrows. He will "set in" with precisely his average width of furrow, settling his plough at once to its running depth. He will look carefully forward in search of any inequalities in the surface or edge of his land; for it is one of the best tests of a skilful workman that his furrow is mapped out, to his eye, far in advance of the end of his plough beam. If he turns on the sward, he will leave it unbroken, and his middle furrow will be so completely cleared of sods that a lady might walk it without soiling her prunella. And above all he will be cool and self-possessed, careful to manifest none of that profitless irritability, under mishaps, which is sometimes witnessed, and which is equally certain to injure the quality of his work and to elicit unfavorable comments from the bystanders. There was no very noticeable deficiency, in these qualifications, in any of the ploughmen at the present exhibition.

There were three competitors for the two premiums on ploughing with the Michigan plough. We were entirely unanimous in awarding the first premium to Mr. Southworth; and we were equally unanimous in the opinion, indicated by the recommendation of a gratuity, that the work of each of the others was entitled to some substantial token of commendation. In some respects, the work performed by Mr. Davis's plough was not excelled by that of any on the ground, and it would have been assigned a higher place in our award, but for the undue haste manifested by the driver, and an apparent want of mechanical skill so to adjust his plough as to secure a due proportion between the width and depth of his furrow. We think the practice of timing the work here objectionable. The committee on ploughing should consist of men capable of judging, without the aid of a watch, whether the movements of a team are active and prompt; while ploughmen and spectators should be disabused of the common notion that a difference in time, of sixty or ninety seconds, in ploughing an eighth of an acre, will have any appreciable influence in determining the award of premiums.

The three horses of Mr. Davis were harnessed abreast, after the English fashion—an arrangement which is economical, in that it enables the ploughman to drive his own team; but we think the line of draught is too much towards the landside for a plough constructed on the usual centre-draught principle. We have no doubt that a plough might be so made as to work well with a team so harnessed.

Mr. Southworth is a veteran competitor for the society's premiums. We could almost wish to see him an unsuccessful one; not to his disparagement, however, but because, when we can see gathered here half a score of ploughmen more skilful than he, we shall believe that in Plymouth County, at least, the art of ploughing is rapidly approaching perfection. Mr. Smith's team consisted of two horses only, apparently well able to perform the work required of them. They were, of course, more completely under the control of the ploughman than any double team could be.

There were but two competitors for the six premiums on ploughing with other than Michigan ploughs. The work of each was well performed, the difference in its quality being, perhaps, less than the difference in the premiums.

In one of the lots ploughed there are many stones within reach of the plough. As this portion of the society's grounds seems to be dedicated to this particular use, we think they should be removed. We should not recommend this, were these obstructions so distributed as to test equally the skill of all the ploughmen; but it is not desirable that one of the competitors should be subjected to constant annoyances from this source, while each of the others is quietly and uninterruptedly pursuing the even tenor of his way.

Did we suppose that the action of the trustees, in excluding oxen from the present ploughing match, was indicative of a disposition on the part of the society to favor the entire substitution of horses, in the labors of the farm, or that such a policy was likely to become general among farmers, we should most earnestly protest against it. But while it continues to be the case that the value of an ox is ever increasing, till he is fitted for the butcher,—and that the value of a horse is as constantly diminishing, till it comes to be measured only by the worth of his skin, we think this matter may be safely left to those calculations of profit and loss which govern most of the transactions of practical farmers.

MANURES.

WORCESTER NORTH.

Experiments with Manures, in accordance with the requirements of the State Board of Agriculture.

Directions for performing the Experiments, given by the Board.

"Select a level piece of land of any convenient size, from twenty square rods up to as many acres or more, which should be as nearly equal in its character and conditions as possible. Divide it into five equal parts, numbering them 1, 2, 3, 4 and 5.

"Divide the manure which it is proposed to apply, and which should be of a uniform character, into four equal parts. At the time of first ploughing in the spring, spread evenly one-fourth of the manure upon plot No. 1, and then plough the whole field of an equal depth. Apply another fourth part of the manure to plot No. 2, and then cross plough the whole field to about half the depth of the first ploughing. Spread another fourth of the manure upon plot No. 3, and harrow or cultivate the whole field; after which sow or plant the whole evenly, with any crop preferred. Finally, spread the remaining quarter part of the manure upon plot No. 4.

"Observe that by pursuing this course, each of the five lots will receive equally, a deep ploughing, a shallow ploughing, and a harrowing or cultivating, the only difference in them being that in No. 1 the manure is buried deep, in No. 2 shallow, in No. 3 buried only slightly, but coated with loam, and in No. 4 left exposed upon the surface; while No. 5 gets no manure. The manure is to be spread broadcast and as evenly as possible. The after cultivation should be the same on each of the lots, and the harvest of each should take place at the same time. * * *

"This experiment is to be continued through a rotation of three years, but no manure is to be applied to the second or third crop. The rotation would be preferred if limited to corn, grain and grass, but is optional." * * * * * *

[As these experiments are to be continued through a course of three years, no report, except of progress, will be expected until the third year, 1862. Three entries were made in this department, and the competitors, severally, furnished the required statements, of which the following are abstracts.—*Sec.*]

Statement of Isaac B. Woodward.

The lot on which my experiment was tried contains twenty square rods. The soil is rather heavy, being a black loam upon a clay subsoil, is moist and retentive of manures. The crop of 1859 was potatoes, manured at the rate of about three cords of horse manure to the acre. For the present crop it was first ploughed eleven inches deep; manured with one hundred and twenty bushels of green manure of neat stock, thirty bushels to each of the four lots; was planted with corn May 9th, the corn being dropped by hand and covered with a hoe, and was hoed three times, using the cultivator the first and last times, and ploughing the second time.

As soon as my corn was planted the wire-worm commenced to destroy it, and what little did come up the cut-worms took at the halves, so that I could not have any experiment this year, but I hope for better success with wheat next year, and grass the year after. When I saw my corn was spoiled, I neglected to keep the synopsis of the weather, required, but think it may be called wet and cold.

Statement of Albert Stratton.

My lot contains forty-five rods; the soil is rather heavy, moist and retentive of manures. The crop of 1859 was grass, without manure. It was first ploughed seven to eight inches deep, two hundred and forty bushels of barn or stable manure applied, and planted with corn, May 25th, in rows three and one-half feet one way and three feet the other, with a hand-hoe; was cultivated three times, twice with a horse-hoe, and once with a small plough, and followed each time with a hand-hoe; was harvested October 16, and the whole product of each lot weighed.

No. 1	produced	125	lbs. corn	and cob, and	140	lbs. stover.
2	“	200	“	“	210	“
3	“	203	“	“	215	“
4	“	155	“	“	165	“
5	“	60	“	“	65	“

The weather was as follows, viz.:—

May,	first third,	dry;	middle third,	very dry;	last third,	moist.
June,	“	wet;	“	moist;	“	moist.
July,	“	wet;	“	moist;	“	wet.
Aug.,	“	moist;	“	wet;	“	moist.
Sept.,	“	moist;	“	wet;	“	wet.

In making this experiment, I divided forty-five rods into five lots, nine rods each; ploughed, harrowed, and applied the manure according to the directions given for each lot; but the season has been rather unfavorable for moist land, and the harvest not great, but it will show the effects of manure applied at different depths, for the first and succeeding crops, other things being equal.

Statement of W. G. Wyman.

My experiment field contains one acre and thirty-two square rods, divided into six equal parts of one-fifth of an acre each. The soil is a heavy loam upon a clay subsoil; is moist and retentive of manures. The crop of 1859 was grass. No manure has been applied during three years previous to 1860. It was first ploughed about seven inches deep, on the 12th of May, after a fine growth of grass had started, which was turned under with a swivel-plough. Five cords of stable manure from a barn cellar, made with horses, cows, and hogs, one cord by accurate measure to each lot, 500 pounds Coe's ground bone, 100 pounds to each lot, and 250 pounds Coe's super-phosphate of lime, 50 pounds to each lot was applied, and the field planted, May 23d, with common yellow corn, with a corn planter, in rows three feet three inches apart each way. It was cultivated with a horse-hoe four times each way, and with a hand-hoe twice, and harvested, Nos. 2, 3, 4, and 5, October 29th, and Nos. 1 and 6 November 5th, and the whole product of each plot weighed as follows, viz.:—

No. 1	produced	879	lbs. sound ears	corn,	11	lbs. soft, and	1,100	lbs. stover.
2	"	785	"	"	26	"	1,034	"
3	"	851	"	"	22	"	1,092	"
4	"	819	"	"	21	"	954	"
5	"	349	"	"	54	"	354	"
6	"	859	"	"	00	"	958	"

The weather was as follows, viz.:—

May,	first third,	dry;	middle third,	very dry;	last third,	moist.
June,	"	wet;	"	moist;	"	wet.
July,	"	very wet;	"	wet;	"	wet.
Aug.,	"	moist;	"	wet;	"	moist.
Sept.,	"	moist;	"	wet;	"	wet.

Having entertained the belief that the thorough intermixture of manure with the soil to the depth to which it is cultivated would prove most beneficial, I added another plot to those required, No. 6, similar in all respects to the others, and applied to it the same kind and quantity of fertilizers, as to the others, spreading one-third of the manure and bone on the grass before the first ploughing, one-third after the first and previous to the second or cross ploughing, and one-third after the cross ploughing before harrowing; the super-phosphate of lime I applied to the hills after the corn was planted. This plot took an earlier start than either of the others, and looked better during the early part of the season; then No. 1 gained upon it and took the lead. The result is given above, with the exception that the corn on No. 6 was riper and dryer than on either of the others. All the plots except No. 6 were treated, in all respects, in accordance with the directions given.

NANTUCKET.

Statement of Edward W. Gardner.

The piece of land which was selected for the experimental application of manure, and entered by me for premium, lies in the east pasture of "Cambridge farm," near the swamp. It is a rich, sandy loam, with clayey and gravelly subsoil, retentive of water and manure, but not wet; and measures forty-five feet by two hundred and twenty-five. For five years (and how much longer unknown) previous to 1859, it had been in grass, without any manure, and in that year yielded a good crop of hay; after which it was ploughed, and manured at the rate of six cords of good barn cellar manure per acre, and was planted with turnips; but in consequence of the great amount of charlock and dog grass which came up, but few turnips grew. Those which got a start were very fine. The charlock was pulled up and fed to the pigs, and not allowed to go to seed; and the dog grass was fed by stock in the fall. On the 30th of March, 1860, it was divided into five equal parts, of forty-five feet square, and on No. 1 was evenly spread three-fourths of a cord of barn cellar manure, composed of horse, cow, and hog droppings, and a little peat muck, and the whole was ploughed full eight inches deep. The same quantity of the same manure was spread on No. 2, and the whole was cross ploughed four inches deep; the same was put on No. 3, and the whole was cultivated and harrowed. On the 11th of May, it was planted with three varieties of corn, as follows: the hills were three feet apart, each way, and four kernels were put into each hill. In the two northern rows, I used small yellow corn, from Berkshire; in the next seven rows, "top-over" corn; and in the remaining five rows, Nantucket white corn. On the 7th of June it was cultivated, and hoed, and the missing hills re-planted with Rhode Island premium corn, having no other seed. On the 6th of July it was cultivated and hoed again. On the 10th of September, cut the top stalks; on the 16th of October, weighed and put the stalks into the barn. October 31, cut up the corn, husked and weighed it. The following table will show the product of corn, of top stalks, husks and stubble, from each division, and of each variety of corn, and the produce per acre of each variety of corn, and the stover.

No. 1. Manure 8 inches deep.

Rows.	Hills.	Varieties of corn.	Number of ears.	Weight in lbs. of husked corn.	Weight in lbs. per bushel.	Weight of cobs per bushel.	Weight of shelled corn per bushel.	Bush. per acre.	Average bushels per acre.	Weight of top stalks.	Weight of husks and stubble.	Weight of stover.	Aver'ge weight of stover per acre.
2	30	Yellow, .	116	20½	70	16	54	46 8-10	-	12	10	-	-
7	105	Top-over, .	355	96	69½	17	52½	63	-	42	83	-	-
5	75	Nantucket,	227	89½	75	22	53	72	-	30	62	-	-
14	210		698	206	-	-	-	-	60 6-10	84	155	239	5,462

No. 2. Manure 4 inches deep.

2	30	Yellow, .	114	19	-	-	-	43 4-10	-	11	9	-	-
7	105	Top-over, .	413	109	-	-	-	71 6-10	-	36	87	-	-
5	75	Nantucket,	213	94	-	-	-	80	-	25	68	-	-
14	210		740	222	-	-	-	-	65	72	164	236	5,394

No. 3. Manure cultivated in.

2	30	Yellow, .	99	12	-	-	-	22 5-10	-	6	8	-	-
7	105	Top-over, .	294	76	-	-	-	49 9-10	-	34	68	-	-
5	75	Nantucket,	192	76	-	-	-	64 8-10	-	20	53	-	-
14	210		485	164	-	-	-	-	45 7-10	60	129	189	4,320

No. 4. Manure spread on top.

2	30	Yellow, .	64	8	-	-	-	12 8-10	-	5	6	-	-
7	105	Top-over, .	288	73	-	-	-	46 4-10	-	38	65	-	-
5	75	Nantucket,	196	65	-	-	-	55 4-10	-	16	57	-	-
14	210		448	146	-	-	-	-	38 3-10	59	138	187	4,274

No. 5. No Manure.

2	30	Yellow, .	28	3	-	-	-	6 8-10	-	4	4	-	-
7	105	Top-over, .	73	10	-	-	-	7 2-10	-	18	15	-	-
5	75	Nantucket,	132	27	-	-	-	23	-	15	26	-	-
14	210		233	40	-	-	-	-	12 3-10	37	45	82	1,874

The amount of rain in May, was 3.216 inches; June, 0.765; July, 2.138; August, 7,970; Sept., 7.050. Total, 21.139 inches.

Table of the Weather.

May,	first third	dry;	middle third,	dry;	last third	dry.
June,	"	dry;	"	dry;	"	dry.
July,	"	dry;	"	dry;	"	dry.
Aug.,	"	dry;	"	moist;	"	dry.
Sept.,	"	dry;	"	dry;	"	moist.

The yellow corn produced twenty-eight and six-tenths bushels of shelled corn, or two thousand pounds of ears, and two thousand four hundred pounds of stover per acre; and the top-over, forty-seven and eight-tenths bushels, or three thousand three hundred and twenty-eight pounds of corn, and four thousand four hundred and twenty-five pounds of stover; and the Nantucket, fifty-nine and nine-tenths bushels, or four thousand four hundred and ninety-nine pounds of corn, and four thousand seven hundred and sixty pounds of stover. The yellow corn ripened two, if not three weeks sooner than either of the other kinds, and was not so much injured by the August storm; neither was it all injured by the heavy frost of October 1st, which very materially damaged the Nantucket, and did some harm to the top-over. The Rhode Island premium, planted June 7th, fully matured, and almost every ear was perfect.

I was induced to commence these experiments with the three varieties of corn, with that of the manure, from the fact that every member of the Board of Agriculture who has visited us, has condemned our native white corn, and recommended the culture of the yellow. But this experiment shows that the same land, and manure, and culture, will produce over one hundred per cent. more of the Nantucket variety than of the yellow, and twenty per cent. more than the top-over, and a much smaller proportion of stover to the pound of corn.

As the weather table shows, the whole of the three first months after planting, were uncommonly dry; in fact, not enough rain fell after the corn was planted, to wet the ground one inch deep, until the 25th of August, when a very violent storm of wind and rain prostrated it to the ground, and from the injury it received, it never recovered. What the results would have been with early rains, we can only conjecture. The lot No. 1 produced the most stover, and less corn than

No. 2, while No. 3 had less than either of the two preceding it. No. 4 less still, while No. 5 produced hardly a merchantable ear.

E. W. Gardner.

PLYMOUTH.

Statement of Amasa Howard.

The society, in 1857, offered premiums "for the most satisfactory experiment to determine the most judicious application of manure." I entered my name the following spring as an applicant for the same, and now submit to you an account of my operations and their results.

The land to be selected was "one acre, of even quality;" mine was also a light, sandy loam, in rather a high situation. I commenced work upon it on the 18th of May; drawing upon one-half, which I shall call No. 1, twelve loads of barn manure, made the previous winter, and ploughing it in, seven inches deep. The other half, No. 2, I first ploughed, then drew on the same kind and amount of manure, and harrowed both parts thoroughly. On the 21st and 22d of same month, I planted it to corn, of the kind known as "Smutty White," after furrowing it three and a half feet square. There were four kernels in each hill. It was cultivated and hoed twice during the month of June, and the stalks were cut September 24th. The work upon No. 2, in all instances, immediately succeeding that upon No. 1.

October 27th, harvested No. 1, which yielded fifty-four and one-half baskets, weighing 2,450 pounds.

October 29th, harvested No. 2, which yielded fifty-three baskets, weighing 2,377 pounds.

January 10th, 1859, shelled and weighed it. No. 1 measured thirty-three and one-sixteenth bushels, weighing 1,781 pounds; No. 2 measured thirty-five and eleven-sixteenth bushels, weighing 1,887 pounds; No. 1 had twenty-two and one-half bushels cobs, weighing 278 pounds; No. 2 had twenty-four bushels cobs, weighing 286 pounds.

The second year, 1859, I drew upon No. 1, May 9th, six loads of manure from under my barn windows, and ploughed it in as before; ploughed No. 2, and harrowed in the same quantity; then sowed to barley and grass. I used one and a quarter bushels of barley to each part, keeping them entirely distinct. The grass seed was clover and fine top. It was threshed by Kilbreth, and yielded thirteen bushels each—not varying in measure one pint.

The third year, 1860, I mowed the piece, which was mostly clover, the 5th of July. On No. 1, there was 1,314 pounds; on No. 2. 1,006 pounds. August 16th, mowed again. On No. 1, there were 605 pounds; on No. 2, 416 pounds.

Statement of Nahum Snell.

To the committee on experimenting on one acre of land, No. 13 in Agricultural Proceedings of 1858, in which the society offers a premium for the best experiment for three crops in succession, to be awarded in 1861. As the three crops have all been gathered, weighed and measured, it is as convenient to send in the result of the same at this time as ever.

The acre of land that I have experimented upon was light, warm loam, in sward. I spread seventeen loads upon half an acre, and ploughed the same; then ploughed half an acre and spread on the same quantity. Harrowed the whole thoroughly, then furrowed the same, putting seven loads upon each half acre, and planted the whole on the 14th of May, 1858. On the 7th of October, Mr. Howland, the supervisor, measured one rod where the manure was ploughed under the sod, which weighed forty-five and one-half pounds; the rod where the manure was spread weighed forty-two and one-half pounds. On the 20th of October the whole acre was weighed,—the half acre where the manure was spread and ploughed under measuring, in the ear, seventy-six bushels, and weighed 3,086 pounds; the half acre where spread on the surface measured seventy-seven bushels, and weighed 3,129 pounds; which, by adding eighty-eight pounds on two rods carried home by the supervisor, makes the whole weight at harvest 6,303 pounds. The whole acre of corn, shelled on the 1st of January, 1859, measured—reckoning fifty-six pounds to the bushel—sixty-eight and twenty-six fifty-sixths bushels, leaving a gain of forty-three pounds upon the half acre where the manure was spread upon the surface.

April 22d, 1859, sowed three and one-half bushels of four-rowed barley, in equal parts, and sowed the same in grass.

Threshed the barley in October; had twenty-nine bushels on the acre—fourteen and one-half bushels on each half acre.

In July, 1860, mowed the same, weighing the whole of each half acre. The whole weighed 1,132 pounds,—the half acre where the manure was spread and ploughed under weighing five hundred ninety-six pounds, and other half acre five hundred thirty-six pounds, leaving sixty pounds in favor of the land where the manure was ploughed under the sward.

It would appear from this experiment that spreading and ploughing under for the long term produces the most, but for immediate use it is best to spread on the surface.

The above is a true statement of the crops. For further particulars, see Mr. Howland's report on the corn crop last year.

INDIAN CORN.

WORCESTER NORTH.

Statement of Joseph Goodrich.

The acre on which I raised my premium corn is a clayey loam. It has been pastured for the last forty years. No manure was applied in 1858 and 1859. It was ploughed only once, about the middle of April, five to six inches deep; harrowed thoroughly once; furrowed one way about three and one-half feet apart; manured with about twenty-seven loads compost, of about equal proportions of muck and droppings from the cattle, composted in the barn cellar, about sixteen loads spread and ploughed under, and eleven loads put in the hill; planted on the 5th and 7th of May by hand with six quarts Carter corn in hills, averaging about two and one-half feet apart; hoed twice, ploughing in connection with the first hoeing, and cultivated the second time; had the top stalks cut about the 14th of September. It was cut for husking about the 29th of September. There are three apple trees on the acre, and the corn under them was small. The cost of harvesting was increased in consequence of the storm and wind prostrating the corn before topping.

Cost of ploughing, &c., about	$9 00
manure,	40 00
seed and planting,	4 00
cultivation,	7 00
harvesting,	8 00
Total,	$68 00

Produce, 6,470 lbs. of ears of corn, weighed October 6th; and about three and one-fourth tons stover.

Statement of Albert Stratton.

The acre where my corn grew, is a light, gravelly loam, on a steep side hill; has been used for pasture land for many years; no manure was applied in 1858 and 1859. It was ploughed once on the 1st of May, seven to eight inches deep, and being hard to apply barn manure to, I used guano, four hundred pounds, broadcast, harrowed in before planting; harrowed twice, and marked for planting one way; applied one hundred and fifty pounds Coe's super-phosphate of lime in the hill, and two hundred pounds plaster; planted May 24th and 25th in hills, by hand hoe, four quarts Carter corn; ploughed and hoed twice; harvested October 29.

Cost of ploughing, &c.,	$7 00
manure,	20 10
seed and planting,	1 50
cultivation,	4 50
harvesting,	7 00
Total,	$40 10

Produce, 5,072 pounds of ears of corn, weighed October 30; and I should judge two tons of stover.

The result of the application of guano, and super-phosphate and plaster, proved beyond my expectation.

Statement of Solon Carter.

The acre on which my corn grew, was in grass, without manure, in 1858 and 1859; is a springy, stiff, clayey loam;

was ploughed in September, 1859, and twice in May, from seven to eight inches; harrowed, furrowed, manured with twelve loads spread, and fifteen loads applied in the hill, and three hundred pounds super-phosphate of lime put upon the manure in the hill before it was covered; planted May 16, with Randall & Jones's corn planter, with six quarts of Carter corn; harrowed both ways twice in a row; hoed by hand; thinned to four stalks to a hill; worked with a horse-hoe once in a row one way and twice the other, followed with a hand-hoe; then, after haying, worked again with the horse-hoe once in a row each way, and harvested October 30.

Cost of ploughing, &c.,	$12 50
manures,	45 00
seed and planting,	87
cultivation,	10 00
harvesting,	8 00
Total,	$76 37

Produce, 4,958 pounds of ears of corn, weighed November 2d and 3d; and three tons stover, estimated weight.

I think the crop on the 1st of August was equally promising with that of 1858, but from that time the weather was so cold that many of the second and third ears on the stalks did not grow as long, nor fill so full as they would have done in an ordinary season.

I present a sample of the Carter corn, and claim that it is the best *variety* known for cultivation in this latitude.

HAMPDEN.

Statement of Wilbur Wilson.

The acre of corn offered for consideration was one of six similar acres. The land is a sandy loam, and grew the previous year corn and turnips. In April carted on fifteen cords of manure to the acre. Planted the Demond variety, three feet apart in drilled rows, or thirty-seven stalks to the rod. Finished planting April 25th, hoed twice, once in May and again in June. Let it ripen untopped and standing. Commenced cutting up and husking September 3d. Laid the corn ears on a floor to dry, and when shelled, had seventy pounds of merchantable corn to every one hundred pounds when first weighed. Allowing sixty pounds to the bushel, it gives ninety-eight and four-fifths bushels per acre. Weighed one hundred pounds of fresh husked stover, and put it away to dry and it shrunk about one-half. Also weighed one row out of thirty-seven on the acre. Estimated from this that there were five thousand seven hundred and thirty-five pounds dry stover to the acre. About a ton of squashes grew on the same land.

RESULT.

$98\frac{4}{5}$ bushels corn, ...		$98 80
5,735 pounds of stover, worth, at $7 per ton, . .		20 00
Squashes, ...		8 00
		$126 80
Labor, ...	$4 00	
Fitting ground, ...	2 00	
Harvesting, ...	8 00	
Manure, ...	45 00	
		$59 00
Profit, ...		$67 80

AGAWAM, November 1, 1860.

NORFOLK.

Statement of John Sias.

The land on which the corn was raised, which I entered for a premium, contains one hundred and fifty-two rods. The soil is partly a yellow and partly a slate loam. Originally very rocky, it was never ploughed before last fall, when the lot was reclaimed from a woody, bushy pasture.

Last spring it was cross-ploughed, and a large quantity of stones carted off. The roots and small bushes were burned on the ground, and the ashes spread over the lot. The ground was then harrowed, crossed out in the usual way, the rows about four feet apart, the hills about three feet apart in the rows.

It was manured with about five cords of stable and hog manure put in the hills, and planted the 7th and 8th of May with six or more kernels to a hill, of the Smutty White or Plymouth County corn. June 9th it was cultivated and hoed the first time; July 2d it was cultivated and hoed the second time, which was all the hoeing the field had. September 15th the stalks were cut, cured and housed. The harvesting was finished November 2d, when we had one hundred and fifty-three baskets equal to those gathered and weighed by the committee when on the ground, making the yield eighty-three bushels and thirty-seven pounds, at the rate of eighty-seven bushels and forty-seven pounds per acre. The expense and profit I reckon as follows:—

Dr.

Ploughing,	$7 50
Harrowing and burning roots,	4 50
Five cords of manure,	30 00
Half bushel of seed corn,	1 00
Planting,	6 50
Cultivating and hoeing twice,	7 25
Cutting and curing stalks,	3 75
Harvesting,	6 00
Taxes and interest on land,	3 25
Ashes from burnt brush and roots estimated at	10 00
	$79 75

Cr.

83 bushels and 37 pounds corn at $1,	$83 66	
4,900 pounds top stalks at $15 per ton,	36 75	
6,000 pounds butts and husks at $7.50,	22 50	
		$142 91
Profit,		$63 16

Or at the rate of $66.31 per acre, without adding any thing for the manure left in the ground.

MILTON, November 7, 1860.

Statement of B. N. Sawin.

My experiment in raising Indian corn was made on one and a half acres of land, the soil consisting of a sandy loam, which had been improved as a mowing field for eight years, without any manure or dressing, producing not more than one thousand pounds of hay per acre. In November last I ploughed with a Michigan plough eight inches deep. The eighteenth of May I harrowed with cultivator harrow, and furrowed with a plough, making the hills two feet ten inches apart each way. I took six cords of unfermented manure from the barn cellar, applied it all in the hill, and commenced planting. The corn was an eight-rowed variety of yellow, and has been raised in this vicinity for more than forty-seven years. I used one of C. H. Sawin's corn-droppers, putting four or five kernels in a hill; a cultivator was used between the rows, and hoed once lightly, leaving the surface level. The top stalks were cut September 11th and 14th. The corn was harvested October 18th to 25th. The committee selected two rods in different parts of the field, which they considered a fair average of the field, which yielded forty-seven pounds of shelled corn ; and allowing fifty-six pounds to the bushel, gave one hundred and five-sevenths bushels, or sixty-seven and one-seventh bushels per acre.

The expense of the crop was as follows, viz.:—

Interest on value of land at fifty cents per acre, and taxes,	$5 25
Harrowing and furrowing,	1 75
Applying manure and planting,	7 50
Six cords manure,	30 00
Sixteeen quarts seed,	68
Crow line,	15
Cultivating one way and hoeing by boy,	2 37
Pulling weeds by boy,	50
Cutting and binding stalks,	2 25
Harvesting corn,	6 87
Total,	$57 32

The value of the crops is as follows:—

306 bunches stalks at two cents each, .	$6 12	
3,000 pounds husks at 30 cts. per hundred,	9 00	
100$\frac{5}{7}$ bushels corn at $1 per bushel, .	100 14	
Credit by one-half manure unspent, .	15 00	
		$130 26
Leaves a net profit of		$72 94

The corn cost about twenty-seven cents and two mills per bushel. My object in making this experiment was to prove that the largest crops are not always the most profitable.

Dover, November 13, 1860.

Statement of Philamon Ruggles.

I planted one acre and fourteen rods of ground, measured by Charles Breck, and on this I raised ninety-four bushels and six pounds of corn.

The expense of raising said corn was as follows:—

Seven cords of manure, $6 per cord, two-thirds of the strength expended, ...	$28 00
Getting out manure and spreading the same, . .	7 00
Ploughing, twice, ...	4 00
Planting, ...	2 50
Hoeing, twice, ...	5 00
Cutting stalks, ...	2 50
Husking corn, ...	6 25
Getting in butts and stalks, ...	5 00
Seed corn, ...	50
Interest on land, ...	9 00
	$69 75

INCOME.

Value of corn, ...	$94 11	
To two tons of top stalks, . . .	30 00	
To two tons of butts, ...	15 00	
		$139 11
Net profits, ...		$69 36

I have usually planted in drills, dropping my corn, a kernel in a place, in a zig-zag form, on each side of the drill alternately. But this year I have planted in hills two feet apart, and the rows three and a half feet apart, running north and south. I plough in half of my manure, and the other half I put in the drills. I plough my ground twice in the spring. On part of the ground I raised corn last year, and on the other part I raised rye. I have usually cut out the suckers, thinking it would benefit the corn; but I find on trial, that it has but little effect on the corn, and the suckers themselves produce good feed for cows giving milk. You may be inquiring after soft, or pig corn, so called. I had only eight baskets of this kind, and these consisted of short ears, and broken pieces of corn which were mostly sound.

MILTON, October 31, 1860.

NANTUCKET.

Statement of Allen Smith.

Having entered as a competitor for the premium for the best experiment in raising corn, I will state that the land on which it grew is a sandy loam, and has been cultivated seven years. Last year (1859) it was planted to wheat, and produced about fifteen bushels per acre. Last fall I spread twenty-five one-horse loads of night-soil, and ploughed about nine inches deep. In the spring, spread twenty-five loads, and cultivated and harrowed until it was very fine. April 21st, planted with a machine about two inches deep, in rows twenty-one inches apart, and about ten inches apart in the rows, two kernels in a hill. Kind of corn used, yellow and top-over. I used the wheel hoe, going through it three times, and once with the hand hoe. About the first of June, thinned to about one hundred and fifty stalks to the rod. Cut the stalks the middle of September; harvested the first of October; and the produce was one hundred and eighty-seven bushels of ears of good corn, and five bushels of soft corn per acre.

VALUE OF CROP.

187 bushels of ears, at 50 cents per bushel, . .	$93 50
2 tons of stalks, ...	20 00
2 tons butts and husks, sold for $6 per ton, . .	12 00
	$125 50

EXPENSE OF CROP.

Ploughing and harrowing, . . .	$3 50	
Planting, ...	75	
Value of seed, ...	75	
Hoeing, ...	5 00	
Cutting and binding stalks, . . .	5 00	
Harvesting, ...	6 00	
Interest on land, ...	3 00	
Fifty loads manure, ...	25 00	
		$49 00
Net gain, ...		$76 50

WHEAT.

ESSEX.

Statement of Joseph Newell.

I enter for premium a crop of wheat (spring) of the Bald variety, which grew on one acre and forty-two rods of land, and weighed 2,315 pounds, as per certificate enclosed with this statement.

The ground till last year had been mowed for a long time; last season it was planted with corn, and manured as follows: I spread upon the sward twenty ox-cart loads of barn manure, and ploughed in about eight inches deep; I then spread upon the furrow as many loads more of the same kind of manure, and harrowed in well and planted; after the corn came up, I applied a handful of ground clam-shells to each hill.

The present season, for my wheat crop I ploughed the lot the 10th day of April, and prepared as usual by harrowing well; on the 14th I sowed three bushels of grain prepared as follows: I took a half hogshead and filled it two-thirds full of water, then putting in the grain a little at a time, skimming all that floated on the surface, and cleansing it thoroughly; then draining off the water, I added strong brine (beef brine) enough to cover the grain, and let it remain say eighteen hours; I then shoveled the grain into a cart, wet, mixing with as much slacked lime as would adhere to it, and immediately sowed broadcast, and harrowed twice. This was on the 14th of April.

The 20th day of April I sowed grass seed on the same lot, and harrowed twice again, and on the 23d rolled it, which finished the labor till harvest. I cut it on the 10th day of August, put it into the barn on the 18th, and threshed it the next week; threshed with flail, and winnowed it twice. The result has exceeded my expectations, yielding thirty bushels strong of plump grain, weighing sixty pounds per bushel to the acre. No manure or dressing of any kind was applied to the crop this year, only as above stated. The soil is a heavy loam, underlying which is a slate ledge, which in many places comes to the surface.

As wheat is the most valuable of the cereal grasses, so it requires the greater care to produce it. The soil intended for its reception, should be brought into as fine condition as possible. To accomplish this, manuring and thorough culture are indispensable. If this is attended to, the soil will be in a loose and fertile state, and will possess such a depth of tilth as will have a tendency to preserve it in good condition. Some crops especially corn, require high manuring, but with wheat, I think the case is otherwise. Land very rich, or very highly manured, is apt to cause, during the hot season of summer, a too rapid growth of straw at the expense of the seed; and rust, lodging, and ultimate failure, is frequently the consequence. But I find myself digressing from a mere statement of the crop in question, and return to give an estimate of cost, &c., in making up which, I charge the usual price for such work in this vicinity.

EXPENSE OF CROP.

To one day, self, man, and two yoke of oxen, ploughing,	$4 00
" " and two horses, harrowing, .	3 00
Three bushels seed, ...	6 00
Sowing and rolling, ...	1 00
Cutting, ...	75
Binding up and putting into barn, ...	5 00
Threshing and clearing up, ...	8 00
Interest on land, $200 per acre, ...	15 00
	$42 75

Credit by 38½ bushels wheat, at $2 per bushel, . .	$77 00
2½ tons straw, $8 per ton, . . .	20 00
	$97 00
	42 75
Net, ...	$54 25

West Newbury, September, 1860.

Statement of Eben G. Berry.

I present for premium a crop of wheat raised on one acre of ground. The seed being a part of ten bushels grown from one half bushel the previous year, near the same spot. The seed was originally purchased in Boston. The amount sown this present season in May was five pecks. Amount *harvested* in August was twenty-six bushels, measured, weighing sixty-four pounds to the bushel.

The land the previous year was planted with *corn*, and was in a fair state of cultivation. The dressing applied was compost, stable manure and soil thrown in the hills, twenty loads to the acre. The soil is a clayey loam, free from rocks, and was twice ploughed, eight inches deep, by one man and a pair of horses, then, when sufficiently dry, was harrowed, sown and bushed. The crop was harvested and threshed by hand.

Danvers, September 25, 1860.

Statement of David Pettingill.

I offer for premium my crop of wheat grown on one acre, the product being thirty-one and a half bushels, weighing sixty-four and a half pounds to the bushel. The kind sown was the Bald-head wheat. The soil is a dark gravelly loam. The land was broke up in the fall of 1857, and planted with corn in the spring of 1858. The manure applied was five cords of stable dressing per acre. It was planted with corn in the spring of 1859, with four cords of stable manure applied to the acre. I used no manure the present season. The wheat was sown on the 18th of April; the quantity of wheat sown was five pecks. I let my wheat stand till ready to thresh. I harvested August 21st.

EXPENSE OF CROP.

Interest on land,	$6 00
Ploughing,	2 00
Sowing and harrowing,	1 50
Five pecks of seed,	2 50
Reaping and binding,	4 00
Carting,	1 00
Threshing,	3 00
Winnowing and use of machine,	1 00
	$21 00

Credit by 31½ bushels and two quarts, at $2 per bushel,	$63 12	
Straw,	12 00	
		$75 12
Net,		$54 12

TOPSFIELD, November 8, 1860.

Statement of Daniel G. Todd.

I present for your consideration, a crop of wheat raised on one acre of land, which was surveyed by Edward Smith of Rowley. It was sowed upon the 31st of March last. The land was ploughed and sowed in less than one day. The ground was harrowed before sowing, all at a cost of two dollars. The ground, two years ago, was worn out field-land; formerly it was bushy pasture land, not worth its taxes, being a light sandy loam. It was top-dressed with four cords of compost manure, worth eight dollars. The ground was broke up last year, and planted with potatoes, and manured with salt hay in the hill. I had a good crop. The wheat raised was the China-tea wheat. On this acre there were 1,445 lbs., making twenty-four bushels and five pounds. I sowed two bushels on this acre. The expense of harvesting, threshing and cleaning, was $6.25. This wheat was weighed in the presence of three disinterested persons. It was thought by those who cut and bound, that we lost from one-fifth to one-fourth by shelling out.

ROWLEY, September 25, 1860.

WORCESTER NORTH.

Statement of Solon Carter.

The acre on which my wheat grew, is a clayey loam. The crop of 1858 was grass, without manure; that of 1859 corn, with twenty-five loads of manure spread, and ploughed in. The corn hills were split two furrows to a row, November 16, 1859; in April, these rows were split as before, and ploughed once, eight to ten inches deep. It was sowed April 25th, with two bushels coffee wheat, covered with a harrow, bushed and rolled; reaped by hand from the 10th to the 15th of August.

No manure was used for the present crop.

Cost of ploughing, &c., ...	$5 00
seed and sowing, ...	3 75
harvesting, ...	9 00
Total, ...	$17 75

Produce, 2,167¾ lbs. wheat, weighed September 11; and one and a half tons straw.

Statement of Cyrus Kilburn.

The lot on which my wheat grew contained one hundred and ninety-nine rods; is a clayey loam. The crop of 1858 and 1859 was corn, with twenty-five loads barnyard manure each year; it was ploughed once, five or six inches deep; harrowed; three or four loads of coarse manure spread on a strip of wet, springy land; sowed the last week in September, 1859, with two bushels per acre of Blue-stem winter wheat; reaped the last of July, bound, stooked twenty-five sheaves to a stook, covered with large hay caps, and when dry, carted to the barn and threshed from the cart with a threshing machine.

The wheat on the wet strip, fifteen to eighteen square rods, proved almost a failure, being thrown out by the frost.

Cost of ploughing, &c., ...	$5 00
manure, ...	4 00
seed and sowing, ...	6 00
harvesting, ...	11 00
Total, ...	$26 00

Produce, 2,476 lbs. wheat, weighed August 3d; and two tons straw.

HAMPSHIRE, FRANKLIN AND HAMPDEN.

Statement of Moses Stebbins, of South Deerfield.

The field of wheat which I offer for a premium, contains two acres, forty-four rods of ground; was in corn in 1859. With twenty loads of manure, one hundred and fifty pounds guano, one hundred and fifty pounds plaster, spread broadcast and ploughed in together, ten inches deep; product, by estimation, eighty bushels corn per acre.

In April, 1860, ploughed the same eight inches deep, and sowed four bushels of wheat, of the China variety, without any dressing, harrowed well four times, harvested the first week in August. Product, eighty-six bushels, of sixty pounds to the bushel, or thirty-eight bushels per acre.

RESULT OF SOWING WHEAT.

Dr.

Ploughing 2 acres, 44 rods,	$3 50
Sowing 4 bushels seed,	8 00
Harrowing,	2 00
Harvesting and threshing,	15 00
Interest on land,	13 50
	$42 00

Cr.

By 86 bushels wheat, at $1.50 per bushel,	$129 00	
two tons straw, at $5 per ton,	10 00	
		$139 00
		$97 00

HAMPSHIRE.

Statement of John A. Morton, of Hadley.

My crop of wheat, which is entered for a premium, grew on one acre and eighty rods of ground. In 1859 I put on twenty loads of green manure, and ploughed in, to the acre. Put a part of the land to tobacco and part to corn; got a fair crop of each. About the middle of April, 1860, I ploughed the land seven inches deep, put on six loads of compost on the poorest part of this lot, and run a harrow over it to level it before sowing; put four bushels wheat into strong brine made of salt, eight hours, turned off the brine and added slacked lime until it was sufficiently dry to sow. The wheat was sown April 18th, and harrowed in with a cultivator harrow. (Grass seed was afterward rolled in.) The crop was harvested August 7th; the produce was fifty-two bushels of good clean wheat, weighing sixty-three pounds per bushel.

Dr.

Ploughing, sowing and harvesting, ...	$8 00
4 bushels of seed, ...	8 00
Threshing and cleaning, ...	10 00
Salt and lime, ...	50
	$26 50

Cr.

52 bushels wheat, at $1.75 per bushel, .	$91 00	
2 tons straw, ...	10 00	
		$101 00
		$74 50

Statement of Levi Stockbridge.

My experiment with wheat was tried on two acres and ninety-three rods of land. The soil was a sandy loam. It was in broomcorn in 1859, and part of it had been planted to broomcorn, more than forty successive years. The land was ploughed the 14th of April, and sown the 16th. Instead of using the harrow, the seed was put in with a large cultivator. No manure was applied, and the seed (two bushels and one-half to the acre) was sown without any previous preparation. It was harvested the 7th and 8th of August, and threshed the 28th and 29th, yielding one hundred bushels of well-cleaned wheat, weighing sixty-four pounds to the bushel, and three and one-half tons of straw. The expense of raising was as follows:—

Seed, ...	$10 50
Ploughing and harrowing, ...	5 25
Harvesting, ...	6 00
Threshing, ...	10 00
Total, ...	$31 75

I make no estimate of the value of the wheat and straw, thinking it better for the committee to make some standard value for all competitors.

HAMPDEN.

Statement of Silas Root.

Winter Wheat.—The crop of wheat presented for consideration was grown on one acre and five rods of ground, the soil heavy loam. I thought it too heavy for wheat, but as a matter of experiment, concluded to try one acre. The ground had lain in grass for a long term of years previous to 1858. In June of that year turned under the turf with a double or Michigan plough, and planted it to tobacco, manuring it well in the hill. The next season put on twenty loads of stable manure; ploughed the land twice, and set with tobacco, after manuring in the hill, getting a large growth of tobacco. The last week in September, ploughed the land and sowed long bearded wheat, the same that I have raised for more than twenty years. I have often sowed other kinds of wheat grown in other States, in the same field side by side, and have never found any that would stand the winter and the blight equal to this. My uniform practice is to sow two bushels of seed to the acre. The growth was very large, and some parts of it were badly lodged. The lodged part was well filled, but the berry not quite as heavy as the standing grain. The crop was harvested the last of July.

Had 45⅜ bushels of grain, worth		$68 06
3,400 pounds of straw,		17 00
		$85 06
Ploughing and sowing,	$2 00	
2 bushels seed,	3 00	
Unspent manure,	10 00	
Interest and taxes on land,	7 00	
Harvesting,	4 00	
Threshing and cleaning,	4 50	
		$30 50
Profit,		$54 56

The cultivation of wheat is considered by some unprofitable or unsafe business. I have been in constant practice of sowing from one to three acres of winter wheat for more than twenty years, and during that time have carefully noted the result, and am satisfied with my course, although in some instances I have had a partial failure. But on the whole, I am satisfied that I have obtained more bushels of wheat from the same ground than I could have had of rye, to say nothing of the difference in the value of the two grains. I am sure that wheat is the best crop to follow tobacco, for the land is all fitted—nothing to do but plough the land and sow the seed. Next to this, green sward turned in in August, and sown in September, with a light dressing of compost or ashes, and the surface well pulverized, will ensure a good crop.

WESTFIELD, November, 1860.

Statement of H. M. Sessions.

SPRING WHEAT.—On the 12th of April last one acre of land was ploughed, and on the 16th, sowed with one and a half bushels of White Bald-wheat, and three pecks of grass seed. August 7th, fifty shocks of grain were harvested that yielded twenty-seven bushels of wheat, weighing sixty-one pounds to the bushel. The year previous the land was broken up and planted with potatoes. Before this, it had been pastured near thirty years. A part of the lot was underdrained, it being too wet for any crop. Sixteen loads of manure were ploughed under each year, consisting of the scrapings of yards and pens, chip-dirt, old plastering, &c. Thirty bushels of leached ashes were harrowed in with the wheat. The wheat was soaked twelve hours in brine and rolled in lime and plaster before sowing. After the wheat and grass seed were sown the lot was set with apple trees. The part that was underdrained being rather cold and heavy, yielded but little wheat, but promises well for grass.

Value of 27 bushels wheat, ...	$54 00
Straw, ...	17 00
	$71 00

Ploughing and sowing,	$4 00	
$1\frac{1}{2}$ bushel seed,	3 00	
Harvesting and threshing,	5 00	
Interest on land,	6 00	
		$18 00
Profit,		$53 00

SOUTH WILBRAHAM, October, 1860.

NORFOLK.

Statement of A. L. Smith.

The field of wheat entered by me for premium, measures one hundred and seventeen rods, and was part of an old pasture until 1858, when it was ploughed and planted with potatoes, manured with coarse manure composed mostly of meadow hay, that had been used for litter under the cattle. In 1859 it was in corn, with a good shovelful of compost manure applied to each hill. Soil, a gravelly loam. The first week in May last I ploughed the ground seven inches deep, and the next week sowed one bushel Java wheat, one cask air-slacked lime, and ten bushels of leached ashes, when the whole were harrowed in together. Harvested in August twelve bushels good wheat, weighing sixty pounds per bushel.

EXPENSES OF CROP.

Ploughing, once,	$1 75
Seed, $2.50, lime and ashes, $1.13,	3 63
Sowing seed, lime and ashes, 50 cts., harrowing, 75 cts.,	1 25
Cradling, 75 cents, binding, $1,	1 75
Threshing, $1.50, carting straw, $2,	3 50
Interest on land, and taxes,	2 24
	$14 12

VALUE OF CROP.

Twelve bushels wheat,	$24 00	
Thirteen hundred pounds straw, sold at 75 cts.,	9 75	
		$33 75
Net profit,		$19 63

DOVER, October 15, 1860.

NANTUCKET.

Statement of Allen Smith.

The acre of land on which I raised my winter wheat is rather high ground, and is what may be called sandy loam. Has been planted three years; first to corn, then to potatoes. The wheat was sown after harvesting the potatoes, about the last of September. The kind sowed was the Blue-stem, and is probably the best for our soil and climate. Sowed one and one-half bushels. The land when planted to potatoes, was manured at the rate of about fifteen one-horse loads per acre. No manure was used on the wheat. It came up well, and spread so as nearly to cover the ground before winter. There was very little killed by the winter. It grew luxuriantly, and produced a large crop of straw. It suffered very much from the drought of July, but notwithstanding, I had twenty-six and one-half bushels of as fine wheat as I ever saw, weighing sixty pounds per bushel.

VALUE OF CROP.

26½ bushels wheat, sold for $2 per bushel,	$53 00
1 ton straw,	7 00
	$60 00

EXPENSE OF CROP.

Ploughing,	$2 50	
1½ bushels wheat,	3 00	
Sowing and harrowing,	1 50	
Cradling,	1 00	
Binding and carting,	1 25	
Threshing, 25 cents per bushel,	6 63	
Interest on land,	3 00	
		$18 88
Net profit,		$41 12

RYE.

HAMPDEN.

Statement of S. D. Smith.

This crop was grown on forty-six rods of ground. Previous crop, tobacco. After the tobacco was taken off, I cultivated it with a common cultivator, sowed the rye and harrowed it in about the middle of August, 1859. The growth of the straw was rank, some straws measuring eight feet. The yield of rye was thirteen bushels, making forty-five bushels per acre. The soil of a clayey loam.

13 bushels rye, $1 per bushel, ...		$13 00
$\frac{3}{4}$ ton straw, $7, ...		5 25
		$18 25
Preparing ground and sowing, . . .	$0 50	
Seed, $\frac{1}{4}$ bushel, ...	22	
Harvesting and threshing, ...	4 00	
		$4 75
Net profit, ...		$13 50

WEST SPRINGFIELD, November 1, 1860.

Statement of Joseph A. Smith.

The crop of rye which I present for your consideration was raised on one and one-third acres of land. The yield was—

40 bushels, weighing 60 pounds to the bushel, . .		$40 00
2 tons of straw, at $8 per ton, ...		16 00
		$56 00
Ploughing and harrowing, ...	$2 50	
$1\frac{1}{2}$ bushels seeds, at $1, ...	1 50	
Harvesting and threshing, ...	8 00	
Interest and taxes, ...	14 00	
		$26 00
Net profit, ...		$30 00

The land on which the above was raised was a dark loam, in good condition, from which, the last year, was raised a crop of corn. The rye was sowed after cutting up the corn the last of September, and sown with grass seed, which promises well.

West Springfield, November 8, 1860.

BARLEY.

ESSEX.

Statement of John L. Hubbard.

I would call your attention to a crop of barley raised by me on one hundred and forty-six rods of land. This crop was raised on two pieces of land, the whole being included in the survey, and at the time of sowing was supposed to contain one acre. The first lot of fifty-nine rods and eleven links, had been under cultivation three years; two with corn, and one with potatoes, as a kind of experimental lot to test the best manner of applying manure; but the trial being unsatisfactory, I will only say that the land was well manured, and carefully cultivated. The soil is a clay loam, the clay in some spots cropping out. Its produce being less than half a ton of very poor hay to the acre, and lying adjoining a fresh meadow, is what is usually called cold, heavy land. It was ploughed the last week in April, and six loads, of twenty-five bushels each, spread on the furrow and harrowed in. The manure was from the horse stable, worked over by the hogs. After harrowing, the land, from its clayey texture, was very nubby, so much so that a roller was passed over it before sowing; two bushels of seed were sown; it was harrowed once, the grass seed sown and harrowed, and finished by rolling. The seed came up quick, even, and grew rapidly, and on the 17th day of June some of it was in head; on the 4th of July it was in full head, and had begun to show the "red row," standing about three and a half feet high, being the handsomest barley I ever saw. A shower on that day beat down a part of it, which never came up again.

The crop was harvested the third week in July, giving thirty-two large cocks on the lot. The other piece, containing eighty-six rods, fifteen links, was worked one day after the first. The land in this case was of much better quality than the other, a part of it being high, sandy loam, running to a lower level, and a deep black loam. This had been in cultivation two years; with corn the first. It was manured in the hill with equal parts of old and green manure composted together. The second year the manure was ploughed in at the rate of twenty-five full ox-cart loads to the acre, consisting of manure from the horse stable, thrown in the barnyard as it was teamed from the city in the fall and winter. When this lot was ploughed this spring, so much manure of the last year's application was turned out, that it was thought unnecessary to apply any more. The land in this case was only harrowed before sowing; the after treatment being the same as in the other case. This did not come up so even as the other, owing, I think, to its not being rolled before sowing. The yield in this case was forty large cocks from two and a half bushels of seed. The yield in grain, as will be seen by the certificates herewith presented, was forty-two and one-quarter bushels from the one hundred and forty-six rods of land, weighing fifty-two pounds to the measured bushel, being 2,197 pounds, or within eleven pounds of forty-eight bushels, at the society's standard of forty-six pounds to a bushel, within a fraction of fifty-two and a third bushels to the acre.

My design in the management of the above named land, was to obtain a good crop of grain, and have the land left in good condition for grass; and my experience, in this and other cases, satisfies me that that is the best way to attain that end. It has always seemed to me, that it is almost useless to expect a good crop of hay, after taking from the land a crop of corn or potatoes and a crop of grain, without the application of any manure after the hoed crop.

It may be thought by many that the amount of seed sown was much too large, but I am satisfied that it was not the case, for those parts of my grain that were the thinnest, lodged the most. Land that is under a high state of cultivation, needs heavy seeding, and if you do not grow straw, you will be sure to grow weeds. I am satisfied too, that rolling previous to sowing, is of very great advantage. I think, to get the best crop of grain, the land should be as fine as an onion bed, because you can see to sow it much more even; the seed gets more evenly covered, and consequently comes up more nearly at the same time. In conclusion, I would say that I entered this crop for a premium, on the supposition that I had an acre, but on surveying it, it fell short. I have made this statement, and you can make any use of it you think proper. The certificates are all enclosed with this statement.

EXPENSE OF CROP.

Ploughing, sowing and covering,		$6 00
Seed,		3 37
Harvesting,		3 50
Threshing,		6 00
Manure,		6 00
		$24 87
Credit by 2 tons of straw, $6 per ton,	$12 00	
Grain,	33 41	
		$45 41
Net,		$20 54

Newbury, November 15, 1860.

WORCESTER NORTH.

Statement of Cyrus Kilburn.

The field on which my barley grew, contains two hundred and thirty-nine rods; it is a clayey loam; was planted with corn in 1858, with about twenty loads barnyard manure; and also with corn in 1859, with about twenty-five loads barnyard manure; was ploughed once five or six inches deep; harrowed; sowed about the middle of April with a mixture of two and six-rowed barley from St. Johns, C. E., at the rate of three bushels per acre; and was mowed about the last of July, raked, cocked and covered with hay caps; when dry, carted to the barn and threshed, with a threshing machine, from the cart. No manure was used for the present crop.

Cost of ploughing, &c., ...	$6 00
seed and sowing, ...	6 00
harvesting, ...	8 00
Total, ...	$20 00

Produce, 2,685 lbs. barley, weighed August 2d; and about two tons of straw.

Statement of Solon Carter.

The acre which produced my barley was in grass in 1858, without manure; in corn in 1859, with twenty-five loads manure spread and ploughed in; the soil is a clayey loam; it was ploughed by splitting the hills, two furrows to a row, November 16th, 1859, and in April, these were split as before and ploughed once eight to ten inches deep; sowed April 25th, with two and one-half bushels two-rowed barley; harrowed, bushed, rolled and mowed by hand, July 27th. No manure was used for the present crop.

Cost of ploughing, &c., ...	$5 00
seed and sowing, ...	2 75
harvesting, ...	7 00
Total, ...	$14 75

Produce, 1,700 lbs. barley, weighed October 4th; and one and three-quarters tons of straw.

The crop was, during its growth, a very promising one, but just as it headed there came a rain, accompanied with wind, which beat it down so that it never recovered, consequently much of it did not mature. I think the crop was made one-third less by this accident, if so it may be called.

NANTUCKET.

Statement of Allen Smith.

Having entered as a competitor for the best experiment in raising barley, I will state that the land on which it grew was a good, strong, sandy loam, containing four acres ; but, owing to a part of it lodging, I mowed three-fourths of an acre, leaving three and one-quarter acres, which produced one hundred and fifty and one-half bushels of barley. The land had been planted to corn two years, and produced a good crop. This year, in March, I spread twenty-four one-horse loads of barn manure to the acre, and ploughed about the 20th of March ; and the 29th, two bushels of common two-rowed barley were sown to the acre, and well harrowed. It came up even, and considering the dry weather, looked well through the season. There was not rain enough to wet the ground through from the time it was sowed, until it was harvested.

It was cut July 20th, and threshed the 1st of August, and measured one hundred and fifty and a half bushels, or forty-six and four-thirteenths bushels per acre.

VALUE OF CROP.

150½ bushels of barley, at 80 cents per bushel, .	$120 40
3¼ tons of straw, at $9 per ton, ...	27 25
	$147 65

EXPENSE OF CROP.

Ploughing and harrowing, . . .	$9 75	
Six and one-half bushels barley, . .	6 50	
Twenty-four loads of manure, ...	12 00	
Mowing and getting in, ...	6 50	
Threshing and cleaning, ...	20 07	
Interest on land, ...	9 75	
		$64 57
Net gain, ...		$83 08

OATS.

NORFOLK.

Statement of A. L. Smith.

The field of oats entered by me for premium, contains one and a half acres. Planted with corn last year, and manured with a shovelful of compost in the hill. Soil, a moist, gravelly loam. Ploughed and sowed the first week in May last, with four and a half bushels of Australian oats. Before harrowing them in I spread ten bushels of leached ashes on about one-fourth of the piece, but did not perceive that the crop of oats was much benefited by it, although I have no doubt the future crops of grass will be. Owing to the press of haying, the oats were not cut until over ripe, and a storm coming on soon after, many of them were scattered in gathering the crop; as many, I should think, as were sown. The oats are quite heavy, weighing thirty-four pounds per bushel. Crop, seventy-one bushels. Straw weighed two and a half tons.

EXPENSE OF CROP.

Ploughing,	$3 00
Seed, 4½ bushels, at 60 cents,	2 70
Sowing, 50 cents, harrowing, $1.50,	2 00
Ten bushels of ashes, 80 cents, spreading, 20 cents,	1 00
Cutting, raking and binding,	4 50
Threshing and cleaning,	8 00
Interest on land, and taxes,	6 80
	$28 00

VALUE OF CROP.

Seventy-one bushels of oats, at 60 cents,	$42 06	
Two and a half tons of straw at $10,	25 00	
		$67 60
Net profit,		$39 60

DOVER, October 15, 1860.

PLYMOUTH.

Statement of Daniel Alden.

The land, one acre and fifty-nine rods, on which I raised my oats, is a sandy loam; it was in grass from 1854 to 1857; planted to Indian corn in 1859, and was well manured with about fifty-six cartloads of compost manure spread on, and about one hundred and thirty bushels of leached ashes sowed on the field. In 1860, April 12th, the land was ploughed with a double Michigan plough, about seven inches deep; on the 16th, sowed the oats and cultivated them in; then sowed grass seed, and then harrowed the ground twice over, and rolled it.

August 3d. Cradled the oats, and on the 7th bound and carted them into the barn; on the first of September, threshed and winnowed them with a machine. They measured one hundred and eighteen and one-quarter bushels. About the 20th, I weighed them, the weight of which was 3,741½ pounds; equal to one hundred and sixteen bushels twenty-nine pounds. The oats were entirely free from smut; the seed sown was Canada oats.

Sept. Sold 1½ tons of straw at $8 per ton, . . .	$12 00
Oct. 1 ton " " " . .	8 00
Straw not sold, ...	5 00
118¼ bushels oats, sold and unsold, 50 cts. per bush.,	59 12
	$84 12

I think there was a loss of oats in the field and in threshing, of from three to five bushels.

EXPENSES OF SEED AND LABOR.

Apr.	12.	To one day's ploughing, ...	$3 00
	16.	cultivating, harrowing, and rolling, . .	2 25
		4½ bush. Canada oats, at 60 cts. per bush.,	2 70
Aug.	3.	cradling oats, ...	1 25
	7.	raking, binding, and carting them in, .	2 00
Sept.		threshing and winnowing them with machine, ...	6 00
		Total expense, ...	$17 20

Statement of Charles G. Davis.

The oats which I entered for premium were raised upon newly reclaimed swamp, this year laid down to grass. I planted two and one-half bushels of Bedford oats, sown April 10th, upon land upon which the manure was first harrowed in—harrowed and rolled the oats. The land comprised just an acre, but taking out the ditches there was 41,250 feet only.

The oats were mowed and stacked—threshed with horse-power on the 5th of October, and measured sixty-four bushels, weighing thirty-four pounds to a measured bushel, which is sixty-eight bushels lawful measure, thirty-two pounds to a bushel. I lost at least four bushels by the hens, and probably much more from mowing and making.

The cost of these oats I estimate as follows:—

Dr.

2½ bushels seed,	$1 80
Half harrowing, rolling and sowing,	1 50
¼ of 8 cords manure, at market value in Plymouth,	8 00
Mowing and making,	3 00
Carting and stacking,	1 50
Threshing, at 8 cents per bushel,	4 96
	$20 76

Cr.

68 bushels at 50 cents,	$34 00	
1 ton of straw, deducting cost of stowage,	10 00	
		$44 00
Net profit,		$23 24
Deduct interest and taxes,		6 30
		$16 94

BROOMCORN.

HAMPSHIRE, FRANKLIN AND HAMPDEN.

Statement of F. H. Williams, of Sunderland.

Agreeable to your secretary's request, I have measured the ground and weighed the brush which grew upon the piece I entered for your society's premium, and find the same to contain one hundred and eighty-four rods. The brush weighed, Dec. 11th, nine hundred and fourteen pounds. The ground has produced a crop of corn, or broomcorn, for several years past. Ploughed the 1st day of May, and planted with machine, three feet by two in the rows. Used compost in the drills, hoed and cultivated three times. The seed got fully ripe, and was harvested before frost.

Dr.

18 cartloads compost, ...		$18 00
Cultivating and harvesting, ...		14 00
Scraping 914 pounds at 50 cents per hundred, . .		4 57
Cleaning up seed, ...		1 75
		$38 32

Cr.

914 pounds brush, at $6\frac{1}{2}$ cents per pound,	$59 41	
$77\frac{1}{3}$ bush. seed, 41 lbs. to bush., at 1c. per lb.,	31 70	
		$91 11
For use of land, ...		$52 79

Statement of Lewis Parsons, of Northampton.

The ground on which the broomcorn was raised which I offer for premium, measures one acre, and lies in that part of the meadow called Middle Meadow Hill. The lot had been mowed for three years. I ploughed it the last of April, five inches deep, and planted it to broomcorn, by hand, about the 1st of May. I planted the hills about two and one-half feet apart, each way. The only fertilizer used was hard wood ashes, thirteen bushels per acre. It was well hoed four times; harvested the fore part of October. The yield of brush was 1,017 pounds, and about fifty bushels of seed.

ROOT CROPS.

ESSEX.

Report of the Committee.

The committee on root crops, report that there were four entries for premiums, for their consideration, two of which were for potatoes, and two for cabbages. The committee, on examination of the statements presented, found that they all failed to conform to some of the most essential requirements of the society. The rule is as follows:—

"Claimants for the premium on grain and root crops will be required to have their land measured by a competent surveyor the crops weighed, and the amount of the same certified by some disinterested person." It seemed to the committee almost absolutely necessary that the above rule should be complied with by all the claimants for premiums, before they could judge of the merits of the several claims.

In all the claims before us, there was only one, that of S. A. Merrill, in which there was any certificate of the measurement of the land; in none of them was the weight of the crop given, and in none of them was there any certificate of the amount of the crop by some disinterested person.

The committee on root crops cannot, like most of the other committees of the society, personally inspect the articles or operations, upon which they are expected to recommend premiums, but they must be governed by the evidence presented to them in the statement which is made.

If the land is not measured, and a certificate of the same appended, the committee must first of all decide who of the claimants can guess the nearest on the measurement of land. If the crop is not weighed, the committee cannot determine who has the best crop, and the certificate of the some disinterested person is necessary to avoid mistakes, as well as to put all claimants upon as equal footing as possible.

In the claims presented for our consideration for premiums, the committee, for the reasons above stated, have decided to recommend no award, but hope that the statements may be published with the report. The committee think it proper to state, for the benefit of the members of the society, that before coming to a full decision on this question, they took counsel of the Board of Trustees then in session, who seemed to be unanimously of the opinion, that the essential rules of the society should be strictly complied with, by all claimants for premiums.

EBEN S. POOR, *Chairman.*

Statement of Daniel Osborn.

POTATOES.—I offer for premium a piece of land in potatoes measuring one acre. The field borders upon the mill-pond of the "Danvers Iron Factory." It has been used for the cultivation of onions until the present year. It was ploughed and planted early in the month of April. The manure used was "Peruvian guano," in the drill, four-hundred pounds to the acre. The variety of potatoes planted was "Jackson Whites," cut very fine. We commenced digging the first of August. We harvested three hundred and twenty-two bushels by actual measurement. All were marketable but fifteen bushels, which were too small. We have sold all but twelve bushels, which are kept for seed. The price obtained was fifty cents per bushel in the Lynn market. The guano cost twelve dollars in Salem. Three days labor in hoeing.

It has been found by actual experiment upon land in this locality, that "Peruvian guano" produces potatoes of a larger and better quality than barn manure. A good method would be to spread broadcast and plough in the dung, using the "guano" in the hill or drill, being careful to have it well mixed with the soil before planting.

SOUTH DANVERS, October 24, 1860.

Statement of Leverett Bradley.

POTATOES.—The crop of potatoes I offer for premium grew upon a small part of the reclaimed meadow, which I have also offered for premium, containing seven-eighths of an acre. The depth of soil or muck was from four to ten feet. The product was two hundred and seventy-two and a half bushels, including all sizes. The kind of potatoes were Riley Reds, and St. Helenas. The meadow was cleared in the spring of 1858, and planted with potatoes in the same year, July 3d, producing a good crop, but injured by early frosts, for table use, not getting quite ripe. In 1859, I planted with potatoes, and obtained a good crop, planting earlier than the year before. This year I planted the latter part of May. I used no manure during these three years, and formed the hills at the time of planting, hoeing only once. If I should plant the same again, or any similar piece of meadow, should not hoe after planting, as I should perform both planting and hoeing at the same time. I think it better for the crop of potatoes, as there are no weeds, and the less the soil is worn, the better.

The potatoes were of good quality, free from rot, although the mildew or rust struck the vines some three weeks before any frost, probably causing a less crop than otherwise would have been, had they not been affected by that fatal scourge. The potatoes have been sold in Lawrence, by the barrel, at the rate of sixty cents per bushel, and more are wanted at the same price, but I cannot spare any more.

For further particulars, I refer you to the committee on reclaimed meadows, or if it is necessary to give more minute statements, please write me.

Methuen, November 3, 1860.

Statement of Robert Bookhouse, Jr.

Cabbages.—The crop of cabbages I present for premium, was grown on three-fourths of an acre of land, that was broke up last September; the following spring it was manured with between five and six cords of compost manure, a portion of which was spread on and mixed with the soil with a cultivator drawn by a pair of horses, and the remainder was applied in the hill.

The seed was sown in a hot-bed, and the plants transplanted in the field about the 12th of May.

The variety planted was Marblehead drumhead, otherwise called the Stone Mason cabbage, which is the standard cabbage in this section.

In the course of the season they were horse-hoed and hoed three times. I commenced cutting for market the 7th of August; the last was cut on September 25th; every plant headed except one.

The whole receipts for the crop amount to $199.85. The most of the crop was sold on the ground at from five to eight cents; those sold in Boston brought eight and nine cents. The expenses on the crop were as follows:—

5½ cords manure at $5 per cord,		$27 50
Work preparing the land and manure and planting,		8 00
Horse-hoeing and hoeing three times,		11 00
Carrying six loads to Boston, at $3 a load,		18 00
Carrying three loads to Salem, at $1,		3 00
Seed, two ounces,		25
Crop, Dr. to,		$57 75
Credit by one-half value manure,	$13 75	
Crop,	199 85	
		$213 60
Profit on crop,		$155 85

Marblehead, November 14, 1860.

Statement of S. A. Merrill.

Cabbages.—I have a piece of land, measuring about one and a quarter acres, from which, in the summer of 1859, I cut about one and a quarter tons of hay to the acre. In November of that year I ploughed this land, and in the ensuing spring, having spread on about five cords of green barn manure, I again ploughed, cross-ploughing, to the depth of four inches, and harrowing well afterwards. I now set my hills for cabbages, three feet apart, (my furrows being also three feet apart,) and to each hill put one shovelful of compost, and covered this with loam about one inch thick, and dropped my seed—planting to the depth of about half an inch. This was about the first week in April. About the first of May, I hoed and thinned, leaving two plants to a hill. On the second hoeing, left but one plant to a hill. When the plants were young, I spread plaster of Paris around and on them, to prevent the little black insects from destroying them ; I did this once or twice a week for two or three weeks.

From this land I have gathered five thousand five hundred cabbages, averaging from twenty to twenty-five pounds per head without stumps. I have weighed several *with* stumps and leaves and found them to average from forty to fifty pounds. I took sixty of the last lot gathered, and had them weighed on J. L. Dodge's scales, and found their aggregate net weight to be one thousand eight hundred and ninety pounds.

In consequence of the great crop of cabbages this year, the prices have been quite low. The average price that I obtained for mine, was seven dollars per hundred. The first part of the season, I sold some for ten dollars per hundred, but none during any part of the season for less than six dollars per hundred. I subjoin some of the most important statistics :—

Cost of marketing,	$110 00
Nine cords of manure,	54 00
Hoeing and cultivating,	22 50
Rent of land,	12 50
Preparing ground,	12 50
One case of plaster of Paris,	1 50
	$213 00
Total receipts from sales at $7 per hundred,	385 00
Net,	$172 00

I also sowed seven thousand cabbages under glass, in March last, of the variety known as "Yorkers." These I transplanted in April into old ground, which had been planted the previous year with potatoes. I placed my hills two feet apart one way, and two and a half feet apart the other, and into each hill put a shovelful of compost made up of barn manure, night-cart manure and meadow mud, in equal parts, using about five cords to the acre. From this acre I got six thousand cabbages, which I sold, between the 10th of June and the 1st of August, at eight cents per head.

SALEM, November 13, 1860.

WORCESTER NORTH.

*Statement of Alonzo P. Goodridge.**

SWEDISH TURNIPS.—The eighth-acre on which my ruta-bagas grew is a sandy loam. The crop of 1858 was corn, with three loads stable manure; that of 1859 was corn, with three loads stable manure. It was ploughed twice in May, about ten inches deep; manured with three loads spread and ploughed in; furrowed and sowed the first week in June, in drills two and a half feet apart; hoed twice, and harvested November 7th.

Cost of ploughing, &c.,	$0 75
manure,	4 00
seed and sowing,	50
cultivation,	1 50
harvesting,	2 00
Total,	$8 75

Produce, when harvested, 5,485 pounds roots.

Statement of W. G. Wyman.

SWEDISH TURNIPS.—The eighth-acre which produced my Swedish turnips is a gravelly loam upon a loose subsoil. The crop of 1858 was corn and beans, with five-eighths cord stable manure and one bushel ashes; that of 1859 was corn and cabbages, with one-half cord of compost of stable manure and muck, and a few pounds of bone and super-phosphate of lime.

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* The statements concerning cultivated crops are made by the Secretary from the returned forms sent to the several competitors. In all cases where manure is estimated in loads, the loads are understood to contain thirty bushels each. The quantity of produce in all cases is ascertained by actual weight of the whole merchantable crop, the weight being certified to under oath.—*Sec.*

For the present crop one-half cord of compost of stable and hog manure and muck was spread and ploughed in; ploughing once, April 30, about nine inches deep. It was crossed with a horse hoe June 9, smoothed with a garden rake, and sowed with a seed sower in drills about twenty inches apart, with River's stubble Swedish turnip seed raised by myself; was cultivated once with a hand hoe and garden rake, and harvested November 5th.

About seventy-five pounds super-phosphate of lime, Coe's manufacture, was spread upon the drills after the seed came up.

Cost of ploughing and other preparation, . . .	$1 00
manure and super-phosphate, . . .	4 50
seed and sowing, ...	25
cultivation, ...	50
Total, ...	$6 25

The tops paid for harvesting.

Produce, 6,200 pounds, equal to 103$\frac{1}{2}$ bushels, or 826$\frac{2}{3}$ bushels per acre.

The machine with which the seed was sown did not distribute it evenly, and many places where no seed came up were filled by transplanting from others where it was too thick. That transplanted did not do one-third as well as the other.

Statement of Alonzo P. Goodridge.

Sugar Beets.—The eighth-acre on which my beets grew is a sandy loam. The crop of 1858 was corn, that of 1859, sugar beets, with three loads stable manure each year. For the present crop, three loads of manure were spread and ploughed in. It was ploughed twice in May, ten inches deep; furrowed and sowed in drills two feet apart the first week in June; hoed twice, and harvested November 8th.

Cost of ploughing, &c., ...	$0 75
manure, ...	4 00
seed and sowing, ...	50
cultivation, ...	1 50
harvesting, ...	2 00
Total, ...	$8 75

Produce, 4,815 pounds of beets.

Statement of Solon Carter.

Mangold Wurzel.—The eighth-acre which I cultivated with mangold wurzel is a clayey loam. The crop of 1858 was carrots, that of 1859, mangold wurzel, manured at the rate of twenty loads per acre each year. It was ploughed the last of April, and again just before sowing, two loads of manure having been spread before the first ploughing, it was then furrowed one way three and one-half feet apart, three loads of manure applied to the furrow, and two furrows turned upon it; the top of the ridge raked; a furrow made by drawing a hoe through it, and one-half pound seed sown by hand, May 25th. As soon as the plants could be seen, I went through with a light harrow, and when large enough to hoe I used the horse-hoe, following with the hand-hoe; this was repeated once, but the horse-hoe was run through five times.

October 20, the roots were pulled and thrown into rows far enough apart for a wagon to go between them, the tops cut off, the roots laid in rows and then thrown into the wagon as one would throw stove wood.

Cost of ploughing and other preparation, . . .	$1 00
manure, ...	10 00
seed and sowing, ...	1 40
cultivation, ...	4 00
harvesting, ...	3 00
Total, ...	$19 40

Produce, 6,720 pounds, equal to 26 tons and 1,760 pounds per acre, or equal to 896 bushels per acre.

Tops not weighed, but think they were worth one-half the cost of harvesting.

HAMPSHIRE, FRANKLIN AND HAMPDEN.

Statement of Henry S. Porter, of Hatfield.

Carrots.—The piece of land on which my carrots were grown contains forty-one rods. It is a heavy loam mixed with clay. I have used it for raising tobacco, for three or four years; have got more than twenty-five hundred pounds to the acre. I ploughed under five loads of manure from the barnyard about the first of May; about the 15th of May I sowed the carrots in drills eighteen inches apart. I mixed cabbage and radish seed with them so that I could more easily trace the rows, in case the carrots did not come well; but I found when hoeing time came, that I needed nothing of the kind, for the carrots came up very thick and healthy. I hoed them three times; at the second hoeing I thinned them out, leaving them less than two inches apart. They grew vigorously until the last of July, when they began to blast, and in a week or ten days the tops were almost dead; so I supposed I should have nothing. About the last of August they began to revive and grew very well until I dug them about the first of November. The amount of carrots, 8,268 pounds. I have some very fine radishes—I should think a good cartload. There were more than two hundred good cabbages.

COST OF CROP.

Manure, five loads,	$7 50
Ploughing and harrowing,	1 00
Sowing and seed,	1 50
Hoeing, three times,	4 00
Harvesting,	5 00
Rent of land and taxes,	3 50
	$22 50

AMOUNT OF CROP.

8,268 lbs. of carrots, at $14 per ton,	$57 87	
200 cabbages,	8 00	
		$65 87
Amount of crop above the cost,		$43 37

HAMPDEN.

Statement of Dr. Long.

Potatoes.—The acre of potatoes entered for premium has been in grass for twenty years or so, to my knowledge, and, for aught I know, has never been ploughed, on account of surface water rendering it too wet most of the season. With the design of underdraining, and rendering it permanently dry, it was drained with open ditches early in the spring, and about the middle of May thoroughly ploughed with double plough, ten inches deep, thoroughly dressed and furrowed three feet apart, and composted manure spread in the furrows continuously, five cords to the acre. The potatoes, two varieties, St. Helena's and Davis seedlings, one-fourth acre of the latter and three-fourths of an acre of the former, were cut and plaster-mixed (an indefinite quantity) and planted one foot apart. Seeded at the rate of ten or twelve bushels to the acre. The potatoes were hoed twice, and weeds cut or pulled the third time; unleached ashes were applied after the first hoeing. The yield was two hundred and twenty-six baskets, measured equally in two baskets, the one weighing, basket out, sixty-nine pounds, the other sixty-two pounds, average sixty-five and one-half pounds, making two hundred and forty-six and two-thirds bushels. The yield of the two varieties was about the same.

By $246\frac{2}{3}$ bushels, at 50 cents,		$123 33
To ploughing land,	$3 00	
interest,	4 20	
taxes,	75	
seed,	5 00	
planting,	3 00	
hoeing,	6 00	
digging,	6 00	
		$27 95
Net profit,		$95 38

HOLYOKE October, 1860.

Statement of Joseph A. Smith.

CARROTS.—The carrots that I offer for a premium were grown on one-fourth of an acre of land from which the previous year a crop of parsnips was raised.

In preparing for the crop, the last week in April, the ground was ploughed to the depth of ten inches. Upon the furrows were spread two and a half cords of fine manure, and ploughed under four inches deep. The variety used was the long orange, sowed in drills sixteen inches apart, and thinned to eight inches in the drill. November 3d, I gathered one hundred and ninety-seven bushels, weighing fifty pounds to the bushel, making

9,850 pounds, which at 38 cents a bushel, or $13 per ton,		$64 76
Value of tops,		2 00
		$66 70
Ploughing and fitting land,	$2 50	
Seed and sowing,	1 50	
Hoeing and weeding,	7 00	
Harvesting,	3 50	
One-half manure expended,	5 00	
Hauling and spreading the same,	1 00	
Taxes and interest,	3 50	
		$24 00
Profit,		$42 76

West Springfield, November 5, 1860.

Statement of H. E. Moseley.

Carrots.—The seventy rods of ground on which was grown the crop of carrots which I offer for the society's premium this year, was treated as follows: one-half of the lot has been sowed to carrots three previous years; the other half was sown the second time this year. I ploughed in fourteen loads of stable manure to the depth of twelve inches, and subsoiled to the depth of seventeen or eighteen inches. The seed was sown the 15th of May at the rate of three pounds to the acre. They were sown in drills eighteen inches apart, and left very thick in the drills, and consequently were rather small. They were hoed three times.

RECEIPTS.

320 bushels carrots, 45 pounds per bushel, 14,400 pounds estimated at $14 per ton, for which 4,200 pounds were sold,	$100 80	
Tops were worth	2 00	
		$102 80

EXPENSES.

14 cart loads manure,	$14 00	
Ploughing and fitting,	2 00	
75 pounds guano,	2 25	
Hoeing and weeding,	12 50	
Digging,	9 00	
Seed and sowing,	1 50	
		$41 25
Net profit,		$61 55

The small size accounts for their not weighing up to the standard. A bushel of large ones weighed fifty-two pounds.

SPRINGFIELD, November 12, 1860.

Statement of S. D. Smith.

SUGAR BEETS.—This crop was raised on one-eighth of an acre which is of a loamy nature, and under a medium state of cultivation. The previous year's crops were potatoes followed by turnips. The ground was prepared by having one coating of manure spread on and ploughed under to the depth of seven inches. I sowed about the 6th of May, in drills one foot apart. These were thinned from four to six inches apart in the drill. Harvested about the middle of October, and measured seventy-three bushels, which weighed sixty pounds per bushel.

73 bushels, at 50 cents per bushel,	$36 50	
Tops,	50	
		$37 00
Ploughing land,	$0 25	
One-half manure expended,	2 00	
Hoeing and thinning,	1 50	
Havesting,	1 00	
		$4 75
Net profit,		$32 25

WEST SPRINGFIELD, November 1, 1860.

Statement of William Birnie.

MANGOLDS.—My crop of mangold wurzel was grown on two and a half acres of land, which in 1859 produced only two thousand six hundred pounds of tobacco. The soil is a heavy loam with blue clay subsoil. Thirteen cords of stable manure were hauled on to the ground, spread evenly, and ploughed in about seven inches deep from the 23d to the 26th of April. It was again ploughed from the 4th to the 7th of May crosswise of the previous furrow, thus thoroughly mingling the manure with the soil, and turning it up near the surface. After being harrowed and rolled, the ground was marked out into drills two feet apart, by a machine drawn by a horse, marking five rows at once about two inches deep. Fifteen hundred pounds of crushed bone, dissolved in sulphuric acid, and sixteen bushels of common salt were sown by hand into the drills. The roller was again passed over the ground, partly filling the drills, but leaving them sufficiently marked to be followed by the sowing machine. The seed, the long red variety, six pounds to the acre, was sown between the 8th and the 12th of May. As soon as the plants were fairly up, from the 1st to 3d of June, they were hoed the first time, and June 10th, cultivated thoroughly with the horse hoe, followed by hand, and thinned by drawing the hoe through the rows, leaving the plants in bunches of three or four, and about eight inches apart, taking especial care to fill all the vacancies, (occasioned by failure of seed or otherwise,) by transplanting. This was done by taking up a bunch of the surplus plants, and the earth surrounding them, with the hoe, and placing them carefully in a hole previously made, in the vacant place; and scarcely a plant thus treated failed. The first week in July the horse hoe was again used, and followed by hand, thinning thoroughly to one plant in a place, and leaving them from eight to twelve inches apart in a row. On the 16th of July, the horse hoe was used thoroughly, which was the last cultivation the crop received, as the leaves had now nearly covered the ground. All the vacancies that now remained were filled with cabbage plants. On the 15th of September we began to strip the outside leaves, and feed to our milch cows. Eighteen two-horse wagon loads were taken from the piece before harvesting, and twelve at the time of harvesting. On the 9th of October we began to gather the crop and finished on the 23d, having taken in seventy-six loads of two thousand five hundred pounds each. We ascertained the weight by sending an average load to the city scales, and weighing it, and using the same wagon to haul in the whole, and keeping each day a strict account of the number of loads secured. The following is an accurate account of the labor and fertilizers used :—

5 days of man and team, ploughing, &c.,	$10 00	
12 days' labor in May,	12 00	
25 " " June,	25 00	
11 " " August,	11 00	$58 00
27½ days' harvesting in October,	$27 50	
10 days, man and team,	20 00	47 50
13 cords stable manure at $6,	$78 00	
1,500 pounds vitriolized bone, (home-made,)	18 75	
16 bushels salt at 20 cts.,	3 20	99 95
Total cost of labor and manure,		$205 45

The land produced seventy-six loads of mangold wurzel, two thousand five hundred pounds per load, or ninety-five tons; eighteen loads of tops stripped before harvesting, twelve ditto when harvesting, (thirty loads,) and four hundred heads of cabbage,—making altogether the total value of the crop about eight hundred dollars. Deduct cost of labor and manure as above, two hundred and five dollars and forty-five cents; balance of profit, five hundred and ninety-four dollars and fifty-five cents. Estimating the weight per bushel of the mangolds harvested at sixty pounds, (which is the actual weight,) we have three thousand one hundred and sixty-six bushels, and the whole cost of labor and manure being two hundred and five dollars, the crop has cost, when safely stored in the cellar, about six and one-half cents per bushel. I estimate that the improved condition of the land, after the crop is taken off, will more than balance the interest on its cost for the year.

SPRINGFIELD, November, 1860.

Statement of Dr. Long.

Swedes.—The Swedish turnips entered for premium, grew on one-fourth of an acre of land. The preceding crop was cabbage. The land was ploughed twice, and manured in furrows two feet apart, with compost manure at the rate of six or seven cords per acre, and ridged by turning two furrows together over the manure. The seed was sowed on the top of the ridges, the last of June, and thinned out at each hoeing, leaving the strongest and best plants, ultimately standing six inches apart in the rows. The yield is one hundred and fifty-eight baskets, weighing sixty-nine pounds each, (basket out,) making ten thousand nine hundred and two pounds.

158 baskets, at 33 cents,		$50 14
Ploughing, twice,	$1 00	
One-half manure,	3 00	
Interest on land,	1 50	
Planting,	1 50	
Hoeing,	3 00	
Harvesting,	2 00	
		$12 00
Net profit,		$38 14

Holyoke, November, 1860.

Statement of S. D. Smith.

Turnips.—This crop was raised on land of a loamy nature, containing forty-six rods. The previous crop was rye, which was harvested about the middle of July. The stubble being removed, a thin coating of manure was applied. The land was ploughed with one horse, July 31st, and sowed to turnips, in drills from twelve to fourteen inches apart. When up sufficiently, were hoed and thinned to about three or four inches apart in the drills. Finished harvesting October 31st.

160 bushel, each 54 lbs., at 20 cents per bushel,	$32 00
Tops for feeding, worth,	2 00
	$34 00

Ploughing, 50 cents; hoeing and thinning, $1,	$1 50	
One-half manure expended,	2 50	
Seed and sowing, 75 cts.; harvesting crop, $1.50,	2 25	
		$6 25
Net profit,		$27 75

West Springfield, November 1, 1860.

Statement of Joseph A. Smith.

Mixed Crops.—The land last year produced wheat and turnips. This year, about the middle of April, it was ploughed ten inches deep. Eight cords of compost manure was spread on the ploughed surface. Early potatoes were planted soon after, in rows four feet apart and one foot in the drill. A little super-phosphate was sprinkled on the potatoes in each hill. In the month of May they were hoed twice. In July one hundred and seventeen bushels were dug and sold for one hundred and thirty-five dollars and seventy-two cents. On the 29th of May, after finishing the potato hoeing, an early variety of corn was planted with a machine between the rows of potatoes, in hills twenty-two inches apart. Super-phosphate was used in each corn hill. On the 11th of June, the corn was hoed and thinned to three stalks in a hill. The corn was again hoed the last of July. Nothing else was done till the last of October, when one hundred bushels of ears of corn were husked. Two bushels of ears shelled one bushel and seven quarts of corn, worth at least, with the stalks, fifty-seven dollars. After clearing out the potatoes the last of July, one pound of English turnip seed was sown among the corn and hoed. In the first week in November seventy-eight bushels of merchantable turnips were harvested, worth at twenty cents per bushel, fifteen dollars and sixty cents. It will thus be seen that the three crops of potatoes, corn and turnips on one acre in the Connecticut River Valley, this year, have yielded $208.32.

117 bushels early potatoes,	$135 72
50 bushels corn,	50 00
corn stalks,	7 00
78 bushels turnips,	15 60
	$208 32

Ploughing land twice,	$3 00	
8 cords manure,	24 00	
Hauling and spreading do.,	3 00	
Plaster and super-phosphate,	8 00	
Dropping same,	50	
10 potatoes bushels, early whites,	10 00	
12 bushels stone hills,	6 00	
Planting,	2 00	
Hoeing, twice,	7 00	
Digging and marketing,	8 00	
½ bushel corn and planting,	1 50	
Hoeing corn twice,	4 00	
Ploughing and cultivating,	1 00	
Cutting and stacking,	2 00	
Husking, (100 bushels, at 4 cents,)	4 00	
1 pound turnip seed and sowing,	60	
Pulling and topping turnips,	2 00	
Interest and taxes,	13 00	
		$99 60
Profit,		$108 72

West Springfield, November, 1860.

PLYMOUTH.

Statement of Charles G. Davis.

Carrots.—My crop of carrots entered for premium I have just stored, and on a quarter of an acre I have raised seven thousand seven hundred and forty-eight pounds, (7,748,) making at fifty-five pounds per bushel, one hundred and forty bushels and forty-eight fifty-fifths fraction over, or at the rate of five hundred and sixty-three bushels per acre. This, I am aware, is less than the amount requisite for a premium. The carrots were of the long orange variety, sown upon drained land, upon a declivity, which was ploughed from the sod two years ago last December, and has been in corn the two summers since. The land is peaty, with a clayish subsoil, but was ploughed last year and this as much as fourteen inches deep. It was dry enough for corn, but the past summer has been so wet, that the carrots were not very long, though very large in circumference.

A violent rain in May scattered the seeds which were planted in drills, and I had little hope of the crop when you saw it during the summer. The spaces I planted with Swedish turnips, and again with the yellow stone round turnips; and now after the crop is removed, the field is green with the turnips. The yield of the turnips will be such as to render the whole crop a profitable and a very heavy one. I put the stable compost manure in open drills, which were covered with the plough, and have hoed three times. A sandy loam is often recommended for carrots, and yet it is often stated that they do well in a drained peat. There seems to be some confusion or inconsistency about this, as one would think that which would do best in one soil would not do as well upon the other.

Dr.

Ploughing,	$0 75
One cord of manure,	4 00
Furrowing, manuring, and planting,	1 50
Hoeing, three times, and weeding—1st time, $1.50; 2d and 3d, $1 each,	3 50
Harvesting,	4 00
Interest and taxes,	3 10
	$16 85

Cr.

By two and a quarter tons of carrots, at $10.50,	$23 62
	$6 77

I have since cropped 2,200 pounds of round turnips on the lot above named.

Statement of Albert Thomas.

Carrots.—The land where I raised my carrots measured forty rods. I ploughed in three cords of manure, harrowed the grounds, and sowed the carrots the 2d day of June, in rows two feet apart; raised one hundred and seventy-four bushels, weighing 9,570 pounds, or at the rate of six hundred and ninety-six bushels per acre. Hoed them twice.

Expense of manure and hauling,	$13 00
seed and planting,	50
hoeing,	7 00
harvesting,	5 00
ploughing and harrowing,	1 50
	$27 00
174 bushels at 30 cents per bushel,	$52 20
Leaving the clear profit of	$25 20

Statement of Charles G. Davis.

French Turnips.—As I entered for a premium upon French turnips, I do not purpose to neglect making a statement of my experience, even though I may not become entitled to the premium.

The new law requires all field crops to be weighed, and I have taken the precaution this year to weigh every thing which comes into or goes out of the barn, from the horse, cow, heifer or pig from month to month, to the hay, oats, and other produce, and have already seen the good effects of this plan in the more accurate and systematic knowledge which is derived from it. I have thus been led to believe that most farmers estimate a much larger amount of product than they actually pruduce, especially in hay and oats.

For instance, I supposed that I had a very good crop of Swedes, with which I felt perfectly satisfied, but they weighed as they went into the cellar, with roots trimmed, 10,265 pounds, which, at sixty pounds per bushel, gives one hundred and seventy-one and five-sixths bushels, or at the rate of six hundred and eighty-seven bushels per acre, hardly up to the society's standard.

I make this statement because I desire to see how it will compare with the statements of others who may have weighed, as they are required to do, every turnip of the merchantable crop.

The quarter-acre sowed was a part of a two-acre field, ploughed and subsoiled last fall. It had been in grass for more than twenty-five years, and how much longer I am unable to discover. It was manured with a hundred pounds of "Phuine," presented to me by my friend, Prof. Stevens, of Girard College, and a sprinkling of sheep manure, harrowed in. "Phuine" is a new, artificial manure, compounded and manufactured by Prof. Stevens, a son of old Plymouth, whom I can recommend as perfectlly reliable and honest. I have tried the article alone on corn and turnips, and have no doubt of its value.

The land was sown in drills, two feet apart, with a seed sower, about June 25th; hoed once, and thinned from ten to fourteen inches apart; the crop was harvested this week, a fortnight earlier than I would have preferred.

Cost of ploughing,	$0 75
manure,	1 50
harrowing and planting,	1 00
hoeing, once, and pulling weeds,	1 00
harvesting,	4 00
Interest and taxes,	3 20
	$11 45
By five tons of turnips, at $8 per ton,	$40 00
	$28 55

November 9, 1860.

Statement of Albert Thomas.

The land where I raised French turnips measured forty rods. Ploughed in three cords of manure—spread and harrowed in twenty-five bushels of ashes; planted the 27th day of June, in rows two feet apart, and hoed once, and raised two hundred and eighteen bushels and forty-sixtieths, amounting, at thirty cents per bushel, to $65 25

Ploughing and harrowing,	$1 50	
Manure and carting,	13 00	
Ashes,	3 50	
Planting and seed,	50	
Hoeing,	2 00	
Harvesting,	5 00	
		$25 50
Clear profit,		$39 75

VALUE OF CROPS.

ESSEX.

Report of the Committee on Comparative Value of Crops as Food for Cattle.

The committee on the comparative value of the different kinds of crops as feed for cattle, beg leave to make the following report. Your committee would much rather have had some subject to act upon that would not have obliged them to make a merely theoretical report, but as there was no claimant for the premium in this case, we are obliged to make such a report or to make none at all, and therefore have concluded to throw out a few thoughts that have occurred to us on this matter. But few farmers are so situated as to be able to carry out a very systematic course of feeding, so as to test the comparative value of the various kinds of food they may have at command. There are a great many things to be taken into consideration in a trial of this kind, as, for instance, the age and condition of the animal at the beginning of the trial, whether in gaining or losing flesh ; the length of time the trial lasted ; if milch cows, the quantity and quality of the milk should also be taken into consideration, and not by any means should the amount of labor necessary to lay in and feed out what is used be omitted. None of your committee have ever made any very exact experiments in this matter ; they are therefore obliged to rely upon the statements of others which they have seen published. Among these there is one which for apparent exactness, and the high authority from which it comes, would seem to be very satisfactory ; but the conclusion arrived at so completely upsets the generally received opinions in regard to the value of many kinds of feed in use among stock-keepers, that we cannot refrain from adverting to it.

In this trial it is asserted that about twenty-four and one-half pounds per day of English hay kept a milch cow in present condition. This would give 4,189 pounds of hay from December 1st to May 20th, and at a cost of $15 per ton, would make the expense of keeping a cow through the winter, $31.41. This seems very satisfactory for a cow of 1,000 pounds, live weight, and is what intelligent farmers would, we think, call a generous allowance. This feed was continued for the term of fifteen days; the same cow was then fed with the same quantity of hay, and an addition of five pounds of shorts per day for fifteen days more, and shows the very remarkable gain of twenty-five and one-third pounds in that time, equal to one and four-sixths pounds per day, or two hundred and ninety-eight pounds from December 1st to May 20th. This increase of weight is valued at four cents the pound, and all credited to the shorts, making them worth $1.35 per hundred weight, or $27 per ton. Now is this a fair trial of the value of shorts? Would the gain be in this proportion for any great length of time, and if it would not, then must not the value of the shorts be reduced in proportion to the falling off on the gain? We have seen, too, that the cost of keeping the cow in hay was at the rate of $31.41 for the feeding season. Now 2,328 pounds of shorts, at $1.35 per hundred weight, comes to $31.42, as the cost of keeping a cow on shorts alone, supposing an animal would live on shorts alone, and no other more bulky food be necessary. This amount gives a fraction short of fourteen pounds per day. Now if the animal will live on this amount per day, give milk all the time, maintain herself in present condition, then shorts are worth what is claimed; and it shows how much better for any one who buys feed, to buy them instead of hay, as the saving of room, and also of labor, would be of great account.

Now are these things so? Will a cow in milk thus keep in present condition for a period of one hundred and seventy-one days? Your committee can hardly think she will on this amount of shorts, and therefore cannot believe that shorts are worth $27 per ton, when English hay is worth $15 per ton.

Another trial from the same source also sets forth as remarkable results as the other. In this case, meadow hay and corn stover were substituted for English hay, and the loss as shown by the statement is very remarkable, being at the rate of five hundred and ninety-eight pounds for the feeding season. Now can this be so? Would the loss be so great for any length of time on this feed? The cow consumed twenty-one pounds of hay and corn fodder, and five pounds of shorts per day, and lost on this feed three and eleven-fifteenths pounds per day, being about six hundred pounds for the feeding season of one hundred and seventy-one days.

The loss is charged to the hay and stover, and the balance struck accordingly, which left the value of the hay and stover to be $3.83 per ton. No account is made of the five pounds of shorts per day, which at $1.35 per hundred weight, would be $11.54 for the feeding season, and showing that meadow hay and corn stover are not worth the housing; for were it not for the shorts the cow must certainly have starved to death.

For the reasons above stated, we believe that an experiment continued for so short a time cannot be satisfactory, and that public opinion has set a value upon the various kinds of feed, much nearer the truth than can be ascertained by a trial of a few days' continuance. Your committee had intended to examine at greater length this report from which have been taken the above statements, but it would extend our remarks more than would be proper, and we will conclude by saying that in our opinion, no kind of food can be substituted for English hay to get the same amount of nutriment at the same cost, and that while roots, shorts and meal may be fed in connection with the various grasses with good results, yet to fix their precise value, would require trials of greater length, and perhaps be more expensive than most farmers would be willing to incur.

We believe that an animal fed on any one kind of food for a few days, and then changed to another better or worse, will show the true value of that food; but in order to get at any thing like the true value of the article used, animals as nearly alike in age and condition as possible, should be selected and fed, each on a particular kind of food, for a period of at least three or four months.

And your committee also believe, that in order to get the most advantage from the article used, that regularity in feeding, both as regards time and quantity, should be strictly observed. If the trustees wish to have this subject further investigated, we think an excellent opportunity presents itself at the society's farm in Topsfield.

As no opportunity has occurred for a consultation among the members of the committee, since the writing of this report, the undersigned is chiefly responsible for what is said in it.

JOHN L. HUBBARD, *Chairman.*

NEAT CATTLE.

HAMPSHIRE.

Report on Neat Cattle.

Many of the societies in the State had no exhibition of cattle at their fairs this year, on account of the disease which had prevailed in Worcester County, and of which some had died elsewhere. It was no doubt in part owing to the fear which some had of bringing their cattle in contact with other herds, that made the exhibition in this department less than in former years. The average quality was better, and the proportion of blood animals much larger. The executive committee, with the view of encouraging the raising of Thoroughbred stock, gave the preference, in offering premiums, to such. We think this is a step in the right direction, for, from our own observation, we have not been able to see much improvement in stock at our fairs.

How few of our members are taking any decided steps towards improving their herds by skilful breeding. The farmer who raises a better animal than his neighbor is satisfied, when he ought not to be, unless he has done the very best he can, which will never be the case, except in very rare instances, and that by accident, without the use of Thoroughbred bulls. There are praiseworthy exceptions in some of the towns that contribute to our fair.

Paoli Lathrop, of South Hadley, the prince of Short-horn breeders in Massachusetts, has been in the business some twenty-five years, and has obtained an enviable reputation throughout the country. His brother, too, Wells Lathrop, is a successful breeder, and has a choice herd of Short-horns.

The stock of South Hadley and Granby shows decided marks of improvement from the influence of these herds. In Hadley, some of the farmers have recently commenced with the Short-horns. A club own a fine Short-horn bull, and are raising some choice grades. T. P. Huntington and Charles Smith have two young cows from Mr. Lathrop's stock, and are raising calves from them. William Newton keeps an Ayrshire bull.

In Sunderland, Nathaniel Smith has one of the same breed; and has some grade heifers. In Prescott and in New Salem, are a considerable number of grade Devons—*perhaps* some full-blood. Edmund Hobart, of Amherst, has a Short-horn bull, and Horace Henderson, a Jersey, and several grade heifers of his own raising, and thinks highly of them.

The writer commenced the foundation of an Ayrshire herd six years ago, by importing some heifers from Scotland, and from selections in the country, and has twenty head of Thoroughbreds and grades.

How is it that breeders in England and Scotland have brought their herds to such perfection, except as above indicated, and that only by long practice, careful observation and experience. The North Devon, which has been bred for centuries, is sure of producing its like; so the Hereford and Durhams or Short-horns, though not bred so long, have assumed a fixed type and character, and each has adapted itself to its locality. They breed for beef, for work, for the dairy, and to some extent for all purposes united.

In order to the highest success, we should have a definite aim. Let the young man, in stocking his farm, begin, if it is all he is able to do, with the best native cows he can select, and with a Thoroughbred bull of the breed he may think best adapted to his farm, and the object he has in view—beef, milk, butter or cheese, and continue to use none but well-bred bulls, and he cannot fail to find his account in it; he will far outstrip his neighbor who pursues the old beaten path, he will get up a better herd for his own farm, and find a market for all his surplus animals, at remunerating prices.

I do not propose to speak at length of the different breeds; each of them has its advocates. Short-horns, it is generally admitted, mature earlier, and attain to a larger size than any other breed, and, consequently, are well adapted for beef; but in rare cases do they excel for work or milk in proportion to their size; a cross is better for either. The Herefords are rare in this vicinity, even if any are found of pure blood; they are comely, thrifty, good workers, good for beef, but indifferent milkers. Nothing can exceed the beauty of form and color of the North Devon—they are sprightly, and hardy for work, good beef animals, and by some it is claimed that they are good dairy stock. There is a great difference in families of them in this respect, owing, no doubt, to a long course of breeding for this purpose. Grades would make a profitable stock for a farm. The Jersey cow, (for we never hear of Jersey oxen,) gives the richest milk, but the quantity is small—the breed can never come into general use. The Ayrshires have been bred to some extent, in the eastern and central parts of the State, but there are few in this section. They promise well for the dairy, for which they have been specially bred in Scotland for a considerable time. Their character has become fixed. It is supposed to be a cross of Durham upon the cattle of the Ayrshire district, and has adapted itself in size to the hilly pastures of its locality.

They are almost uniformly good for milk,—hardy, thrifty, lively, intelligent, easily kept, and large enough for a cow. They fatten easily, make good beef, and, though they may not attain to the size of some breeds, we see no reason why they are not adapted for the entire stock of a farm.

In accordance with the statement of Dr. Loring in his address, that where he found superior stock in several places, upon inquiry it was ascertained that it had descended from Thoroughbred animals, I may venture to mention, that, being desirous of knowing what had been the result of an importation of Ayrshire stock, by the "Massachusetts Society for the Promotion of Agriculture" in the State, and of their efforts to introduce the breed, by allowing the county societies the use of their bulls, I found that some of the best cows in three or four of the towns in this vicinity descended from that stock, and that in Berkshire, Hampden, and Worcester, the facts were the same. But for want of care, breeding down instead of up, the blood is running out. "*Blood will tell.*"

It is vital to our interests, to choose a breed and raise stock with reference to our circumstances and market. With the high price of land, and dense population of Massachusetts, we can do better than make beef. The West is to do that on cheap pastures and cheap grain. Our oxen, when done with for work, our cows, when too old to be profitable for milk, and a few surplus young cattle, we turn over to the butcher to supply the home market.

Milk, butter and cheese, and veal are much more profitable. To dairy farming we shall more and more turn our attention, and to this end we should select and breed our stock.

L. Sweetser, *Reporter.*

NORFOLK.

Report of the Committee on Cattle.

The committee appointed to examine and report on the cattle exhibited at the show of the society for 1860, submit the following :—

The alarming prevalence of the disease called pleuro-pneumonia among the cattle of a portion of the State, during the past winter and spring, induced the Board of Agriculture to recommend to the county societies, the omission from their lists for the year, of the customary premiums on this class of stock. The recommendation was undoubtedly a proper one, under the circumstances which prompted it, although the sequel has shown that in some sections of the State, the gatherings of cattle at the annual shows would not, probably, have been attended with any ill consequences. This society acquiesced, as did others in the eastern division of the State, in the recommendation alluded to; but as, previous to the time of the show, it seemed evident that no harm would result from cattle being collected on that occasion, the trustees deemed it proper to solicit, without offering pecuniary inducements, an exhibition of some stock which it was known would be examined by the public with satisfaction. We are happy to say that the invitation was so fully responded to, as to add greatly to the character and interest of the general exhibition.

Most prominent among the cattle brought to our notice, were those of the Kerry breed—one bull and seven heifers—imported by Arthur W. Austin, of West Roxbury, from the county of Kerry, Ireland. They are probably the first genuine specimens of the breed ever exhibited in this country, and many persons regarded them with curious eyes. In consequence of the loss of the bull first imported by Mr. Austin, he obtained another, "Mountaineer," which, with two heifers, arrived in July last. The five heifers of the previous importation are believed to be now in calf by this bull, and are expected to come to milk in April next. They have gained remarkably since their arrival, —averaging an increase in girth of nearly an inch a month for the first year. Their indications for dairy purposes are all that could be expected from the high reputation of the breed. The bull is beautifully shaped—the forehead broad, the eyes large and full, the muzzle open, the upper and lower lines of the body almost entirely straight—while his thick, furry coat and elastic hide, indicate at once an ability to endure a severe climate and to thrive rapidly.

It is not necessary that a particular description of this breed should be attempted in this connection, as that was done pretty fully in the Transactions of last year by the chairman of this committee, by whom the animals of Mr. Austin's first importation were selected in their native country. To correct an error, however, which seems to prevail in regard to the Kerry breed, it may be stated that in the lower sections of the county of that name, the Long-horned cattle are kept, from which some people seem to have obtained the idea that *they* are the *real* Kerries. It may be observed that there were two original breeds in Ireland—one of which, occupying the more fertile and level portions, corresponded in general character to the Long-horns of England; the other, occupying the mountainous districts, of smaller size, of darker color, being generally black—with upright instead of drooping horns, like the cattle of the low country. Both breeds were always considered good for the dairy. Of late years, owing to changes in the occupancy of the land and the mode of farming, the modern, beef-making Short-horns have been extensively introduced from England, but their intrusion is regarded with little favor by the small farmers and cottagers, with whom butter-making is an important object. As an illustration of the light in which some of this class view the change alluded to, we may refer to "A Lament for the Old Irish Cow, by Kitty Conner," lately published in the Belfast (Ireland) "Whig," and inscribed to the members of the North-East Agricultural Society. Kitty begins by saying—

I had a cow—my Drimindhu—
  When Pat and I were joined together;
And I may say that for a day
  She scarce was ever off the tether.
    Och! wirrastru! my Drimindhu,
    Your glossy coat all did admire;
    My shining sloe, your like I know
    Will never stand in shed or byre.

But "Pat," she says, sold her "Drimindhu," and purchased a Short-horn. The results of the enterprise are shown in the following verse:—

And when the Short-horn calved in May,
Of corn and "cake" she got a skinful—
But may I never sin, if she
Gave at milking half a tinful.
Och! wirrastru! my Drimindhu!
You needed neither "cake" nor corn—
On just dry hay three times a day,
You gave a canful night and morn.

Kitty is greatly mortified, as the neighbors passing ask—"Is there no more churnin'?" and her thoughts turn to her Drimindhu, who, with only "a taste of hay three times a day," gave "galore of butter." Pat tries to pacify her by giving the aristocratic pedigree of the Short-horn:—

Says Pat to me, "Och, gramachree,
Her 'pedigree' shows dukes in dozens;
'The Royal Dane,' and 'Lady Jane,'
And 'The Sultan,' too, are all her cousins."
Och! wirrastru! my Drimindhu!
Such nonsense puts me past my patience;
My darlin' cow, I miss you now,
Although you had no grand relations.

My curse upon them, night and day,
And may their grief be great as mine is,
That first brought o'er to Erin's shore
Those Short-horn cows and Cochin-Chinas.
Och! wirrastru! my Drimindhu!
From shady Barrow's banks I brought her;
And oft I dream of that fair stream,
And her eyes, placid as its water.

Mr. Austin exhibited with the Kerries a heifer bred in the island of Unst, the northernmost of the Shetland group. She was brought over with the first importation of Kerries—is of a silver-dun color with a coat of hair resembling soft wool. She makes an interesting contrast with the Kerries, differing from them strikingly, both in color and shape, being deeper in the fore-quarter and flatter in the rib than they. She has become excessively fat on grass, and her flesh is laid very evenly over the body. This heifer is in calf to the Kerry bull, Mountaineer.

We should not omit to mention that Mr. Austin exhibited also a fine cow, which is a cross of the Jersey and Ayrshire, and a heifer two years and three months old, from this cow, by a Jersey bull, with her calf. They are very fine animals. The heifer is unusually promising for the dairy—giving, at the time of the exhibition, as stated, fifteen quarts of milk a day.

E. R. Andrews, of West Roxbury, exhibited the fine Ayrshire bull Albert, imported by the Massachusetts Society for Promoting Agriculture, in 1858. He is a beautiful animal—one of the best of the kind, in every respect, that has ever been brought to this country,—and it is to be hoped that our farmers will improve the opportunity afforded of crossing some of their best cows with so excellent a representative of this valuable dairy breed.

Several of the progeny of the so-called "Jamestown bull" were exhibited. This animal was by a Jersey bull out of the celebrated "Jamestown cow" brought from Ireland in the ship Jamestown, and for several years owned by John D. Bates, of Swampscott, by whom the bull in question was bred. The leading characteristics of this cow corresponded to those of the Suffolk breed. The bull was kept in Dedham several years, and many heifers of his get were reared, some of which have come to milk. They generally give promise of superior milking properties. Specimens of this stock were exhibited on this occasion as follows:—

HEIFERS.—William Whiting, one; J. P. Maynard, one; John Cawley, two; Eben Wight, one; Francis Marsh, three; Eliphalet Stone, one; Thomas Barrows, one; Francis Alden, three; John Conners, one; M. P. Sumner, one; Henry Cormerais, two; B. M. Farrington, three; William Fales one.

BULLS.—John Cawley, one; William Fales, one; Jesse Farrington, one. All the exhibitors of this stock reside in Dedham.

Among the animals above named which deserve special notice, are the two heifers of Henry Cormerais. Their appearance indicates much of the Jersey blood; they would be taken as extra specimens of the half-bloods of that breed. This appearance is partly accounted for by the fact that their dams were grade Jerseys, which, with the one-half of that blood in the sire, has given the strong impress alluded to in the progeny. These heifers are not only very handsome, but their points give them a high rank for dairy purposes. The heifers of E. Stone and Wm. Whiting are of good size, thrifty, and in every respect promising. One of John Cawley's heifers is three-fourths of the blood of the Jamestown bull, that is, both she and her dam were got by him. She is rather small—which may be owing to poor keeping—but her points would place her high in the scale of merit. The yearling of Francis Alden, and the two-year-old of William Fales, are commended. Luther Eaton, of Dedham, exhibited a two-year-old heifer which had reared a calf. She appeared to be a good milker. The committee were not advised as to her blood.

Of the bulls of the Jamestown stock, there were none on which the committee could bestow very high praise. That of Jesse Farrington had clean limbs, a fine tail, and tolerably elastic, but too thin skin, which, however, was of a good, yellow color; but he was too narrow across the loins, and had too much laxness of frame and tissue to possess the requisite constitution. And here we may remark, that there appears to be a tendency in the so-called Jamestown stock to run into coarseness of frame, with a want of that degree of firmness in the system necessary to give strength and hardihood,—qualities so important to the stability of a breed and its ultimate profit. If the stock is to be perpetuated to advantage, it will be necessary to select those which are as free as possible from the defects mentioned, both in regard to themselves and their ancestors.

Most of the Jamestown stock exhibited, was, like the sire, without horns. Mr. Cormerais' heifers and one or two others, had good horns.

SANFORD HOWARD, *Chairman.*

HORSES.

WORCESTER NORTH.

From the Report of the Committee.

We would congratulate the society upon the increased interest in the horse, as shown by the exhibition to-day, of specimens of unusual excellence, of the class submitted to this committee. Having no place on which to show to any advantage the movement and speed of this noble and beautiful animal, we were obliged to content ourselves as well as we could, by examining his points, and witnessing his motion as he went around such a space as we were able for a short time to command.

The business horse, that is, the horse which is best, on the whole, for all kinds of work, most in demand by the great majority of our people, and of course the one for which premiums are offered by this society, should possess a good share of the following points and characteristics, the more the better, viz.: he should be compact, to insure endurance and hardiness of constitution. Youatt says, "as much strength as possible in a little space." Legs short; fore-legs and hind-legs about equal in length; the withers sharp, thin, and a trifle higher than the hips; the fore-legs well spread at the chest, to give room for the development of the vital organs, perpendicular and straight, knees wide and flat, clean and compact, from knee to fetlock short, free from meat, the back cords large, standing out well from the bone; viewed from the front, the legs should be thin, from the side, wide and sinewy; the fetlock rather wide, and thicker in front than behind; pasterns short, neither upright nor very sloping. Mr. Hinds, quoted by Linsley, says, "horses having long and sloping pasterns soon tire." The hoof should be nearly round, open, at the heel, smooth and hard. The shoulders long and oblique, thin and flat at the withers; hips long and wide; croup a little sloping; the quarters full; wide at the stifle; the muscles of the thigh plump and full well down to the hock. The hock should be wide, short, free from lumps, the point long. Below the hock the legs should descend perpendicularly, the hocks no nearer together than the fetlocks. Neck should be of moderate length, tapering towards the head, slightly crowning; on such shaped necks the head is almost always well placed. The head should be small, lean and tapering rapidly from the jowls to the muzzle; the forehead should be long and broad, muzzle thin, lips small and firm, nostrils large and prominent. The eyes wide apart, large and prominent, with a pleasant expression, the lids well open when at rest; the contrary denotes dullness. Ears small, thin, tapering and upright, set well apart. The back short, broad and nearly straight, body deep at the shoulder, the barrel round, back and hips well joined, having no depression just forward of the hips, loins wide and muscular, well ribbed up. The tail should be full, heavy, and carried well up. He should be between fourteen and a half and fifteen and a half hands high, rather under than over, and weigh about ten hundred and fifty pounds. Such is the description, mainly from Linsley, of a horse which we should expect to combine the qualities most to be desired in a horse for "all work," and this is nearly the description of a good Morgan.

Though form and characteristics are of primary importance, blood should never be neglected. The farther back the pedigree of both parents can be traced through good specimens, the greater the probability that the expectations of the breeder will not be disappointed. It is now in proof, says J. S. Skinner, "that this Morgan breed is descended from a horse that was stolen from Gen. De Lancey, importer of Wildair, and there is every reason to believe that though he may not have been Thoroughbred, he is well steeped in the best blood of the Anglo-American turf horse."

That "like will beget like" is commonly admitted to be true, but if the male and female parents are very unlike each other, the offspring would probably be unlike either. It is admitted that the chances that the good, and the danger that the bad qualities of an ancestor, will be inherited by any descendant, will depend upon the number of degrees he is removed from that ancestor, unless his ancestors of the opposite sex have exhibited the same qualities. When the ancestors upon both sides for several generations have been alike in all their important features, then "like will beget like," though there will still be a great variety in the degrees of excellence, even then. Prof. Cline, of London, as quoted by Skinner, says: "When the male is much larger than the female parent, the offspring is generally of an imperfect form. The proper method of improving the form of animals consists in selecting a well-formed female, proportionably larger than the male. The improvement depends upon this principle; that the power of the female to supply her offspring with nourishment, is in proportion to her size, and to the power of nourishing herself from the excellence of her own constitution. The size of the fœtus is generally in proportion to that of the male parent, and therefore when the female parent is disproportionately small, the quantity of nourishment is deficient, and her offspring has all the disproportions of a starveling. But when a female, from her size and good constitution, is more than adequate to the nourishment of the fœtus of a male smaller than herself, the growth must be proportionably greater. The large female has also a greater quantity of milk, and her offspring is more abundantly supplied with nourishment after birth."

Youatt says: "It may, perhaps, be justly affirmed, that there is more difficulty in selecting a good mare to breed from than a good horse. Her carcass should be long, in order to give room for the growth of the fœtus; and yet with this there should be compactness of form and shortness of leg."

Linsley, in his prize essay, says: "The stallion should be selected partly with reference to the form and characteristics of the mare, and he should possess in a high degree those qualities in which the mare is most deficient. *In all cases* he should be compact and possessed of a vigorous constitution, have a bold, resolute style of action, high spirit, and a great deal of that nervous or vital energy which gives life to the whole."

Again Linsley says: "All experience shows that the horse of medium size is far the most capable of performing great feats upon either the turf or road in carrying weight at *long distances*. The Arabian, universally admitted to possess astonishing powers of endurance under light weight at high speed, is rarely fifteen hands high. Of those horses that have distinguished themselves as trotters, a very large majority of them have been under fifteen and a half hands high. 'Fanny Jenks,' who trotted one hundred miles in nine hours, forty-two minutes, was only fourteen and one-half hands high, and weighed only nine hundred and thirty-five pounds. Tom Thumb, who performed one hundred miles upon Sunbury common, England, in ten hours, seven minutes, in February, 1829, was only fourteen and one-half hands high, and his driver and sulky weighed two hundred and fifty pounds; and we think more instances can be adduced of great feats at long distances, performed by horses under fifteen than over sixteen hands high."

The great improvement of the breeds of horses in England, which took place many years ago, is said to have arisen from crossing with those diminutive stallions, the Barbs and Arabians.

We believe it to be a fixed law of animal life, that in medium size shall be found the greatest activity, the best constitutions, the greatest power of endurance, and the most courage and vital energy.

T. R. BOUTELLE, *Chairman.*

NORFOLK.

From the Report of the Committee.

The committee on horses respectfully report that the exhibition and performance of the horses at the society's fair this autumn, formed one of its most interesting and attractive features.

In a county abounding in pastures, as the county of Norfolk does, it is remarkable that so little attention is given to the breeding of horses. There is always a good demand for, and a good horse will command a reasonable, and often an unreasonable, price. We have fine horses in the county, but comparatively few are raised in it. We are by no means disposed to encourage mere speed ; there are other qualities that make the animal more valuable for the ordinary purposes of business. A good horse is not one that will merely go in 2.40 or three minutes, but one that will safely and cheerfully perform his ordinary work or journey in fair time, and, perhaps, having latent qualities, will be capable, upon emergency, of exhibiting endurance and any reasonable speed when more than ordinary is required. All who can afford to keep a horse would prefer to have a good one—one that will not fret himself or driver, and yet, with all the multitude raised in other States for the general market, we are not perfectly certain of finding what we want. Such is the general business of a New Englander, that the division of labor established in England, where there is a distinct class of horse for every distinct occupation, will never probably obtain here. What is commonly wanted in this region, is a compact horse of about a thousand pounds weight, with not a superfluous hair about him. We see no reason why the number raised in this locality might not be greatly increased, and, with due care, the quality much improved. Taking into consideration all the chances and risks attending the rearing of colts, we do not wish to convey the impression that a profitable return will always be made to the breeder; but we conceive that those who are fond of the horse, and have opportunity, might be willing to run some moderate risk, in the attempt to raise a satisfactory animal.

The great difficulty in producing what is desirable, lies in the uncertainty of the animal from which you undertake to breed. To obtain a good product, you must have a good sire and a good dam. Without these, all your care and labor will, probably, be in vain. It is, therefore, proper to know, not only the antecedents of the animals from which you intend breeding, but to know as much as possible of the antecedents of their ancestors. Qualities, mental and physical, good and bad, and even habits, we have reason to know, are transmissible from generation to generation. It is not policy to breed from any dam that has a physical defect. The famous English horse, Eclipse, had a natural mark of a dark color on his quarter which mark, though not a defect, was noticed in his progeny in the fifth and sixth generation. If such a casual mark as that would be transmitted for such a length of time, it certainly is of consequence that there should be no time and expense thrown away upon those animals which have obvious defects, mental or physical.

The dam should be capacious, of good disposition, good constitution, and good habits. It may safely be asserted that no really good man ever came from a bad mother, and we should vainly expect a good and serviceable colt, from sire or dam, who had vicious habits, vicious propensities, or physical defects. Both sire and dam, then, should possess intelligence, good-nature, good constitution, and good habits. The sire should be spirited,—a quality not inconsistent with good disposition, though many spirited horses have strong tempers,—a fault that undoubtedly may be attributed, in many instances, to defective education; but however good in other respects, however symmetrical or gifted with physical beauty, we would caution against the use of any sire that had vicious qualities or habits. An irritable horse, with a disposition to be kicking, or biting, or crowding in the stall, is a brute not entitled to the care and companionship of man, and no one has a right to offer such for the use of the public, no matter how beautiful his form, or satisfactory his pedigree.

The Morgan, or Vermont horse, answers our working, farming, or general purposes, better than any other that has appeared in New England ; if it have a dash of the Messenger blood, or of the Thoroughbred again infused, it might, probably, be somewhat improved now ; but, taking it as it is, those who have the stock in perfection will hardly look for a better.

In concluding these brief suggestions, we would recommend that measures be taken by the society to have at its disposal such a horse for the use of the county as will help to improve our stock of horses generally, being convinced that it would be a salutary measure, encouraging our farmers to devote more attention to keeping up the breed of that animal, upon whose good qualities so much of pleasure, convenience, and comfort depend.

Arthur W. Austin, *Chairman.*

SHEEP.

ESSEX.

Report of the Committee.

At the present time we cannot find sheep enough in the county about which to make an interesting report, and if we write, it must be about what has been, or what ought to be in it. Fifty years ago nearly every farmer's family spun their own yarn, and made the cloth for their own wear ; and while this state of things existed, it was natural for each one to raise their own wool. But the erection of factories, and the improved method of making cloth, have stopped the sound of the spinning-wheel and the loom in our kitchens, and driven the sheep from our pastures.

The idea has been prevalent, that if we did not want the wool for our own families, it was more profitable to keep cows than sheep. The merino sheep fever, which raged with such violence in this county from 1812 to 1816, had an influence in causing many farmers to give up their sheep. The interruption of commerce at that time, by the war with England, caused the price of fine wool to rise ; many sold their coarse-woolled sheep, and entered into the merino speculation, with the belief that they would soon make an ample fortune by it; but the diseases which many of them contracted on the voyage from Europe to this country, and the larger number that were kept together, caused many of them to die, and the public soon came to the conclusion that they were not adapted to our climate; and those sheep which but a short time previous had been bought at one thousand or fourteen hundred dollars per head, either died or were sold for a trifle.

Hon. William Jarvis, of Weathersfield, Vermont, when he was American Consul at Lisbon, sent home large flocks in 1809, 1810 and 1811. When it was established, by actual experiment, that their wool did not deteriorate, they again rose in favor, and it was soon found that they could be easily acclimated here. At this time the Essex Merino Sheep Company was formed, and imported largely, and rented farms in various parts of the county and placed them under the care of shepherds from Spain; but, unfortunately, they brought with them the foot-rot and the scab; and the ignorance of some of their agents, and the dishonesty of others, soon involved the company, and it was not long before they lost most of their flocks and all of their capital stock.

The prostration of our woollen manufactures, which took place soon after the restoration of peace with England, rendered the merino of little value, and many who had invested largely in them were ruined.

Although various other causes may have operated to lessen the number of sheep kept in the county, the more important inquiry now is, whether it is the part of good husbandry for the farmers of this county to keep sheep? One fact meets us at the outset of this inquiry, which is, as the sheep have decreased, our pastures have deteriorated. How far this has been owing to devoting them exclusively to dairy purposes, it may not be easy to determine, but we know that it is one of the inevitable results, that if we continue to take from the soil, year after year, the same ingredients, without in some way restoring them, we shall sooner or later exhaust it.

Whatever may have been the cause, we know that our pastures are covered with moss, bushes and briars; and the walls thereof, if not broken down, are so settled and crooked, that they make but a poor fence for either cattle or sheep. Can we by the aid of sheep, reclaim our pastures without costing more than they are worth? Hitherto the first objection to trying it has been the dogs: now we have the dog law to protect us, so far as it goes, and if they are killed, we call upon the town for pay; but timidity is one of the strong characteristics of the ovine race, and the constant yelping of the worthless curs about our streets and pastures keeps them so frightened that they will not thrive. We have been told by those who have been called upon to enforce the dog law, that they are met by the question—Who keeps sheep? Why enforce the law when there are no sheep for the dogs to kill? If the farmers kept more sheep, it would obviate this objection. It might be well for this society to take some action that would cause the dog law to be better enforced by the town authorities.

The next objection is the want of suitable fences. It is sometimes said in answer to this objection, that if land is not worth fencing, it is not worth owning and paying the taxes upon. But the old walls now answer as division, and the cows seeing nothing better on the other side, think it will not pay to crawl over; but sheep have a strong propensity to explore the next enclosure. This trait is more fully developed in what is called the native or Yankee sheep, than in those that have been imported recently. How far this is an hereditary trait, or the result of education, we will not decide. This disposition to ramble has caused many hard feelings between neighbors, and we would not advise any one to keep sheep to reclaim a pasture without first making a suitable fence. A rail or board fence four feet high, or a pole placed upon stone wall will make a safe enclosure. Mr. Page, of South Danvers, uses netted wire upon the top of his wall. We have seen upon Mr. Pierce's farm in Topsfield, small posts placed by the side of the wall about twenty-five feet apart, set leaning so that a wire fastened to it will be over the wall about six inches above it, then another wire placed about ten inches above that. This is cheap, and we should think a durable fence.

Another objection to keeping sheep, is that they are wild and apt to stray away. Many of the old breeds of sheep seem to have retained a large portion of the promise given to Noah when he came out of the ark: "And the fear of you and the dread of you shall be upon every beast of the earth." By good keeping and kind usage, this dread has been overcome in many of the imported breeds, and they are docile and easily managed.

Some say that they do not want the care of sheep and a dairy both. Are we not at this time suffering in this county from this feeling? If we had continued more in the mixed husbandry practiced fifty years ago, who doubts that our pastures would have been better than they are now? It is well for the mechanic and the manufacturer to concentrate all their powers upon one object, but the producer must not rely exclusively upon one article. We had a strong illustration of the evil of this in Ireland, when the potato rot came; and the onion maggot and the cattle disease are teaching us that mixed husbandry is the safest.

Are sheep profitable? We will give a few facts which have recently come under our own observation. A neighbor of the chairman bought, last December, eight sheep, for two dollars and fifty cents each. They were wintered upon poor hay and turnips. In July he sold eight lambs for three dollars and ninety cents each; the wool was probably worth over one dollar per head. We saw Mr. Page's flock, of South Danvers, last winter. He had thirty. The butcher told us that he paid him one hundred and seven dollars for lambs they brought, and had a good bargain. We were looking at Mr. N. Pope's sheep early in June, 1859. He had five sheep, which brought him ten lambs. He said the butcher offered him forty-five dollars for the lambs a few days before. We know that good lamb sells as high in our markets in May, June and July, as good poultry does in November, December and January, and we think it can be raised much cheaper.

Sheep are very social in their habits. If many are kept, they will not mate with the cows or other stock upon the farm; but if we put one or two with the cows, they soon become attached to them and seldom leave them. By beginning in this way, we can keep a few sheep with our cows without much trouble.

We think that we are favorably situated in this county for raising lambs for early market. Sheep are fond of salt hay and the coarser grasses that grow upon our fresh meadows, particularly the *Osmunda Spectabilis*, or buckhorn. By giving them a small quantity of beans or corn daily, they can be wintered well, and if the lambs are sold early, they will recruit before winter, even if they are required to feed our pastures closely.

There were but two entries for the premiums offered for sheep—Richard S. Fay, of Lynn, and Jacob Farnham, of North Andover. The committee were unanimous in awarding to Mr. Fay the first premium of ten dollars, for his flock of Oxford Down ewes. Mr. Farnham exhibited a lot of grade South Downs. Some of them were good, but the committee thought, as a whole, they were not worthy of the second premium. On some of them we noticed the marks and galls of the fetters. We cannot expect sheep to look well if they are kept fettered ; in the words of one who has written much upon sheep husbandry, we would say, that "fettering may be done, as a last resort, by those improvident farmers who prefer, by such troublesome, injurious, and at best, insecure means, to guard against that viciousness which they might so much more easily have prevented from being acquired."

The chairman would say, if he had been called upon to express an opinion, it would have been in preference to Mr. Fay's Oxford Down, but the committee, on whose judgment we could rely, thought that the Cotswold buck was the best suited to the wants of this county. It cannot be expected of us to act very wisely upon a subject of which we have had so little practical experience. Mr. Fay's animal received a prize in England, where he had to contend with the best bucks in the kingdom. This is not the first time that an Englishman has been beaten by a Yankee. If we have erred in judgment, time alone can tell which is the best animal for our own wants. If at our shows the progeny of the Oxford Downs shall be better than that of the Cotswold, the committee will most cheerfully acknowledge that they were mistaken. In order to test the matter, we hope to see in the offer for premiums next year, a premium for the best lot of lambs, not less than four in number, not less than four, nor over eight months old.

We extract the following from Spooner, an English writer:—"The Cotswold is a large breed of sheep, with a long and abundant fleece, and the ewes are very prolific, and good nurses. The superior hardihood of the improved Cotswold, their adaptation to common treatment, together with the prolific nature of the ewes and their abundance of milk, have obtained for them much attention. The quality of the mutton is considered superior to that of the Leicester, the tallow being less abundant, with a larger development of muscle or flesh." The Cotswold sheep have a bright, intelligent look, compared with the dull, dirty-faced look of the Oxford Downs, but this may be an objection rather than an advantage for practical purposes. It is well to have sheep that do not know too much. If ever ignorance is bliss, it may be when our sheep do not know that there is any better feed than they enjoy. The Oxford Downs look as if they knew just enough to eat, drink, sleep and grow fat.

William R. Putnam, *Chairman.*

Statement of Richard S. Fay.

You ask me to furnish some information respecting the breed of sheep which I have had on my farm for several years, some of which were exhibited at the Essex agricultural show last week, under the name of Oxfordshire Downs, by which they are now known in England. Until lately, however, they have only been recognized as half-breeds, although for more than twenty years they have been known as a distinct breed of sheep, such is the dislike in England to the introduction of new breeds in competition with old established ones.

A very good account of these sheep is to be found in the fifteenth volume of the Royal Agricultural Society's Journal, 1855, page 228 and onwards, where they are spoken of as Down Cotswolds. A very good description is also given of them in a previous volume of the Journal, by W. Druce, published in 1853. A more full and complete account of this breed is given by Mr. Charles Howard, in an address before the London or Central Farmers' Club, which is quoted in the May number of the Farmers' Magazine for this year, page 401. What you find stated there is confirmed by my own experience; and, after seven years' trial, I am satisfied that there are no sheep so well adapted to New England as these. From my full and seven-eighths breeds, consisting of fifty-two ewes, I had, this season, seventy-three lambs, which were dropped in February and March, all of which did well. These ewes yielded an average of seven pounds unwashed wool, some going as high as twelve pounds six ounces, worth thirty-five cents per pound. I claim for them superiority over other sheep, for "their hardiness of constitution, large frames, good fleeces, aptitude to fatten, and mutton of superior quality." My original flock I selected from the one belonging to William Gillett, of South-Leigh, mentioned in the first article referred to. The ram exhibited before your committee was from W. Bryan's flock, a successor to Mr. Gillett. He is a shearling ram, weighing two hundred and forty-five pounds, and is unquestionably the finest specimen of the breed ever imported. I regret that my engagements were such that I could not furnish you with this information when the animals were exhibited. I am happy, however, to hear that sheep breeders who saw them were fully impressed with their excellence.

LINMERE, October 1, 1860.

MIDDLESEX.

Report of the Committee.

Although there were no sheep on the ground at the exhibition, owing perhaps to the "frowning heavens" that lowered over us on that day, yet your committee feel that the culture of sheep is a subject of much importance to the farmers of this county, and they avail themselves of the present occasion, to present some considerations relating to it.

Previous to 1812 most farmers in the county kept a few sheep, and many who did not claim to be farmers, kept one or more cossets to supply wool for domestic use. The wool was spun and woven or knit in the family. Large quantities of cloths, flannel and blankets were manufactured of excellent fabric, and enduring quality. Until after the period above referred to, little woollen cloth was made in manufactories established for the fabrication of woollen cloths. The commercial difficulties of that period interfered with the importation of wool and woollen goods, and led to the establishment of manufactories, and to an increased demand for domestic wool. About the years 1808 and 1810 Chancellor Livingston and Mr. Grove, of New York, Col. Humphreys, of Connecticut, Mr. Jarvis, of

Vermont, and other public spirited citizens imported large numbers of merino sheep from Spain and France, which were rapidly distributed, and greatly improved the character of the native breeds already in the country. Elkanah Watson, Esq., the father of the Berkshire Agricultural Society, deserves honorable mention also in this connection, for his efforts to introduce merino sheep into this State. About 1786 the French government devoted great attention to the culture of sheep. It imported from Spain the finest merino sheep that could be obtained, and in the space of ten years, raised the average product of wool from six and one-half pounds to nine pounds per head. The king of Prussia and the elector of Saxony at the same time devoted earnest attention to sheep culture.

From the European flocks thus improved, the finest samples were selected for importation into this country. The climate and soil, especially of New England, were found well adapted to their constitutions and habits.

These importations, with those which have been subsequently added to them, constitute the basis of the wool-bearing sheep now in the country, and it is believed that no finer sheep can now be found in the world for the production of wool.

They belong to the smaller varieties of sheep, are prolific and hardy, and their thick heavy fleeces enable them to bear the variable and extreme weather of our climate. They are now spread over the Western and Southern portions of the country.

In 1850 there were nearly twenty-two millions of sheep in the country, yielding fifty-two and a half millions of pounds of wool. The number has greatly increased since 1850, and yet more than twenty millions of pounds of wool are annually imported.

Within a few years the long-woolled varieties have been introduced, among which the Leicester and the Cotswold are the most prominent. Their wool is particularly suited to the fabrication of worsted goods, and the demand for it is rapidly increasing.

They are much larger than the fine-woolled varieties, are hardy and prolific, and make excellent mutton, not unfrequently weighing from forty to fifty pounds per quarter.

The South Downs, a middle-woolled breed, have also been introduced within a few years, and "for hardiness of constitution, beauty of form, and combined value of wool and mutton, rank with the best in Europe or America. Their mutton indeed has a reputation that commands for it a higher price than that of any other breed." In England their meat usually averages about twenty pounds per quarter. They are remarkably prolific and easily reared. They prosper upon light pastures, and winter well with ordinary keeping. In their habits they are domestic, docile and quiet. They yield an average fleece of six to seven pounds. Probably this breed is better adapted to our rugged climate and hard soil than any other. But the particular breed which any one should select, must obviously depend upon circumstances, and the particular object he has in view in keeping them. The value of mutton, the price of wool, the convenience of the market and the value of the land must be taken into the account. The merinos and small breeds will thrive well on a broken, rocky soil, where scarcely any other stock will obtain a living.

The Leicesters and Cotswold require rich and fertile pastures. Lands in the immediate vicinity of a market are usually considered too valuable for the production of wool, at least it may be raised with more profit on cheaper lands, and more remote from market, while the production of mutton is more successfully carried on upon good soils with ready access to market.

The facilities of transportation are now so great, that wool may be brought to market, even from distant parts of the country, at the cost of a trifling addition to the value of the pound. Hence it is obvious that wool-growing may be carried on more profitably where lands are cheaper than they are in most parts of this county. The keeping of sheep, then, merely for the wool, will not probably be resorted to by the farmers of Middlesex.

But it is believed that by combining the advantages of wool-growing and mutton-raising, the keeping of sheep may be again rendered profitable, and that the keeping of the large breeds chiefly for their mutton will be found good husbandry.

Major James S. Grennell, of Greenfield, in his report upon the stock exhibition in that place in 1859, remarks, that "The larger breeds will produce more lambs, and by good keeping, both their quantity of wool is increased, and their tendency to breed, and their capacity to bring up their lambs. Such sheep will bring up an average of fifteen lambs to ten sheep. Large, early lambs, well started, and allowed a pint of meal daily for the last two months, will readily find a market here in May and June at five dollars per head. The care and trouble of such a flock bears no proportion to that attendant on a flock of fine-woolled sheep. The larger breeds are not only more prolific but hardier, and on account of their size, less liable to be worried by dogs, less liable to disease, not so apt to ramble, and bringing quicker returns, are more profitable to small farmers. The middle-wools, when six years old, are capable of being made into superb mutton from their great aptitude to take on fat, and carcasses averaging one hundred and ten to one hundred and twenty pounds, at ten cents per pound, and a dollar for the pelt, making twelve dollars or thirteen dollars, show a handsome profit on the cost of raising and fattening. Of the various breeds probably the South Downs are at present the greatest favorites."

The committee of the Plymouth County Agricultural Society, on sheep, say: "We would recommend for every farmer, however limited his number of acres, to keep a few sheep." A writer in the "Country Gentlemen," the last year, says: "I bought three ewes, two years ago this spring. Two of them had four ewe lambs, and last year, six of them had eight ewe lambs, making in all fifteen ewes. I paid fourteen dollars for the first purchase, and the wool has about paid the keep, and I have just received seventy-five dollars for the flock."

The above remarks are as applicable to the farmers in Middlesex as to those in any other county in the State.

But the keeping of sheep is profitable not only from the product of wool and mutton, but from the tendency which their keeping has to improve and enrich the land for all agricultural purposes. There is no manure dropped by animals upon the land so fertilizing as that of sheep, and none so evenly distributed, or which suffers so little from waste. A distinguished German writer has calculated that the droppings of a thousand sheep during a single night would manure an acre sufficiently for any crop. By using a portable fence and moving it from time to time, a farmer might manure a distant field with sheep, at less expense than that of carting and spreading manure. By a little pains, a large quantity of excellent manure may be made in the winter, from a flock of sheep. Another and a strong reason remains why the farmers of Middlesex should return to sheep husbandry.

Many of our pasture lands exhibit a broken and rocky surface, but little amenable to the plough. Other portions are sandy plains, and lie at a distance from the homes of their owners. Since the discontinuance of sheep culture, these pastures have been severely cropped by neat stock, and have now become nearly worthless. Many of them are covered with bushes and briars, or with mosses and worthless grasses. Experience shows that sheep walks instead of becoming exhausted, uniformly grow better and more productive, and that one of the most effectual means of destroying the bushes and mosses, and bringing back the white clover and sweet grasses to an exhausted pasture, is to turn upon it a flock of sheep. A gentleman writing from Plymouth County in 1859, remarks: "Some of the finest examples are afforded here of the effects of feeding sheep upon pastures that have become exhausted of nutritious grasses, and grown to bushes, briars, brakes and moss. I have seen pastures to-day that had become almost worthless, but now green and smiling as a lawn, with every inch among the rocks covered with the richest pasture grasses, and not a blackberry vine, wild rose bush, mullen or other useless plant in sight. The sward does not seem bound and compact, but loose and porous, and filled with the most healthy and vigorous roots. The sheep grazing upon these pastures afford ample evidence of the richness and luxuriance of the grasses upon which they feed. These examples, with similar ones which I have observed in other places widely remote, would seem to shed light on the perplexing question so often asked, How shall I reclaim my old pasture? All over New England there are thousands of acres producing little or nothing, that might be renovated by the introduction of sheep upon them, while the profits of the sheep themselves I believe would be larger than from the same amount of money invested in cows. I have been told of an instance where a hundred acre pasture fed scantily only twelve sheep and six cows the first year, but on the second summer fed well twenty sheep and twelve cows, and continued to increase in fertility until more than double this number was fed upon it." R. S. Fay, Esq., the highly intelligent secretary of the

Massachusetts Agricultural Society, remarked in 1855: "The great diminution of sheep husbandry in this State, is much to be deplored. Sheep are the most active and profitable agents in the work of amelioration and farm improvement." There is abundant testimony from intelligent and observing agriculturists to the same effect.

The principal objections to sheep culture are the destruction occasioned by dogs and the expense of fencing. The former objection, we trust, is obviated by the wise provisions of the existing law. If they are not sufficient, the matter is in the hands of the farmers themselves. They can have such legislation as will meet the necessities of the case.

The second objection would have more weight, if we had only the long-legged, agile breed of sheep that roamed over our hills sixty years ago. But breeds are now to be found, that are quiet and orderly, and may be easily restrained by a common fence, or at most by the addition of an extra rail, or a pole on the wall, and these are the breeds which both interest and convenience will induce our farmers to keep.

Our conclusions then are that the farmers of Middlesex should return to the keeping of small flocks of long-woolled or middle-woolled sheep, that they will find their products of wool and mutton a source of profit, and especially that it would be the means of ameliorating the condition of the exhausted pasture lands, and restoring them to their former fertility.

JOSEPH REYNOLDS, *Chairman.*

WORCESTER.

From the Report of the Committee.

The business of sheep raising in this county has of late years received but little attention, and a few facts in relation to this department of husbandry may be worthy of consideration. The matter has become a serious one with our farmers, how their worn out and stony pastures which cannot be cultivated are to be renovated. Where plaster can be applied with benefit, and the expense of cartage is not too great, it is a valuable and cheap fertilizer. But many soils derive no benefit by its use. How then shall these pastures be reclaimed? It is claimed that sheep will renovate them. They readily feed, too, upon many of those grasses and low bushes that neat stock reject, which have crept into our pastures, and which cannot be extirpated.

It has been asserted—and we have no reason to doubt the fact—that to a pasture that will keep a given number of cows, as many sheep may be added without impairing its fertility. And as six sheep require about the same amount of food as a cow, per day,—or two and a half and three per cent. of their weight,—it will be seen that a farmer can pasture a few sheep with his neat stock, with little or no added expense, and at the same time increase the fertility of the land. By stabling our dairy cows at night, as is the general custom, our pastures are becoming rapidly exhausted.

From the testimony of those who have gone extensively into this branch of husbandry, particularly those in the Valley of the Connecticut, and in Essex County, no stock pays a better profit than sheep; and it will not be claimed that any portion of the Commonwealth is better adapted to sheep-growing than Worcester County.

In England, where lands are of much higher value than with us, and mutton and wool bring about the same price as here, sheep-growing is an important branch of production, and is regarded as profitable. In the selection of breeds, regard should be had to the value of the wool, and the weight and quality of carcass.

A. G. Hill, *Chairman.*

HAMPSHIRE, FRANKLIN AND HAMPDEN.

Report of the Committee.

In attempting to make a report upon sheep, your committee are aware that in some respects they are travelling a beaten path, and that they are, on the contrary, to seek for truth among the conflicting statements of interested parties, and unsettled opinions of undecided experimenters.

The first inquiry that presents itself to the person who essays to buy a flock of sheep, is, will it pay? On this point there is the unanimous opinion of all parties that it will. So far as the product of wool and mutton is concerned, it is conceded that sheep are as profitable as cows, if not more so; and that it is obtained with less labor.

There is another consideration which ought not to be overlooked. The inquiry, since sheep-keeping has been abandoned, is often started, "What shall we do to improve our worn-out pastures?" When sheep were universally kept, this question was never asked, because sheep are ever improving the ground on which they feed. It is said that in England, land is sometimes manured by confining sheep on a small surface at night and moving their pens till the whole field is treated to a few nights' lodging. Stephens says that a dressing thus given by three hundred sheep is sufficient in a week for an acre of land, and is worth fifteen dollars. We have other testimony to the same point. We deem these suggestions worthy of serious consideration. May not the universal deterioration of lands in our rural towns be attributed to the fact that the keeping of sheep has been abandoned for the keeping of cattle? It is laid down as a fact among the English farmers, "that the wealth and success of a farmer may be pretty well calculated by the amount of his sheep stock."

We are not prepared, however, to recommend the keeping of sheep to the entire exclusion of cattle. They are both needed upon the farm, and while it is impracticable to keep both at the same time in the same field, they should occupy the same land for pasture in alternate years, that it may thus be kept in a productive condition: the sheep supplying that which the cattle have exhausted.

The next inquiry that suggests itself is, "What breeds of sheep are most desirable for our farmers to keep?" The answer to this must of course be varied by circumstances. If the farmer is so situated that the fine-wools are to be preferred, then he will probably find nothing better suited to his purpose than the Spanish merino. Matthew Smith, of Middlefield, who has kept a flock of this breed for many years, and whose opinion in such matters is worthy of confidence, gives a decided preference to them over all others, for localities where raising lambs for an early market is not practicable. He keeps the same flock of ewes through successive years, but changes the buck annually, which he usually obtains from the best flocks in Vermont. He also deems it important to procure the different bucks from different sections of the State. In this way he has greatly improved his flock and nearly doubled the amount of wool from each sheep.

The long-woolled sheep next claim attention. That kind of long wool which is strong enough for making delaines, commands a price nearly equal to good fine-wools, but the almost universal want of strength in such wool, prevents its being used for this purpose, and hence this class of wool being unfit for broadcloths, must necessarily go down into competition with ground rags and whatever else may be used for the purpose, and be worked into satinets. The long-woolled breeds, Cotswolds, Leicesters, Oxfords, &c., have desirable qualities for the shambles, however, but we are not convinced from the best evidence we can obtain; that they are on the whole, as profitable as some other kinds. Samuel Thorn, of Dutchess County, N. Y., an extensive and intelligent importer of some of these breeds, has, after a long trial, abandoned them—a fact of some consequence to those who lack experience in these matters.

Our third and last inquiry brings us to the consideration of the middling-woolled sheep, as combining qualities suitable for the shambles and for wool-raising.

Samuel Thorn, whom we have already quoted as a man of experience in these matters, gives his preference to the Webb importation of South Downs, as being superior to all other varieties, or breeds. His flock combine many good points, in some of which they excel all others. Their bodies are long, legs short, wool close, firm and sufficiently fine to command a fair price for cloths.

H. F. French, in the "New England Farmer," says: "What we want for sheep in New England is, the breed that, considering the climate and soil, will give us the greatest return in the shortest time. Early maturity, weight and quality of meat and of fleece, aptitude to fatten and fecundity, are the points to be considered. In the fertile fields in the south and west of England, the Leicesters, in all but the last quality, seem to combine a larger average of those good points than any other. They are not so prolific as the South Downs. My own belief is that they will not be found well adapted to the poor fare and cold winters of New England. The South Downs are far more hardy, producing a better quality of mutton and wool, though not quite so heavy a fleece. They do not mature so early or attain so great a weight of meat as the Leicesters, when fed in the English style, with turnips and oil cake. They are accounted far more prolific, a flock of ewes often averaging one and a half lambs, while a Leicester flock does well to average one lamb to each ewe."

The sheep on exhibition at the recent show in Northampton, were chiefly South Downs, mixed with other breeds. Although they were good animals, and in many respects far ahead of ordinary flocks, we are inclined to think that purer blooded animals might be made still more profitable to the owners. Good points, well established, are very desirable, as they can be relied upon with some degree of certainty. The South Down sheep of Mr. Linus Greene, of Hadley, were large and hardy looking. Mr. Greene sold his lambs from them last summer, for more than five dollars per head. He replenishes his flock by lambs raised as cossets. The buck of John A. Morton, of Hadley, also a South Down, mixed with merino, was the best looking animal of the kind, exhibited. His fleece is firm, and of tolerable fineness, and his body of good proportions. The buck of J. M. Chapman, of Westhampton, was a fine animal and yields a heavy fleece, but of coarser grade. The only other buck exhibited, that of Orange S. Moore, of Southampton, was of the English and Leicester breeds. He was five and a half months old, weighed ninety-six pounds, and possessed desirable qualities. But our examination of these various animals, with the information obtained of their owners relative to their respective value, tended only to confirm our opinion that the South Downs are *the* breed of sheep which will yield the greatest profit to the farmer. There is an insuperable objection to some of the long-woolled sheep, which, were there no other reason, will prevent their becoming a favorite with large farmers. They do not thrive well in flocks, unless they have extra care and feed.

Without citing further proof of the suggestions we have made, we leave the subject in the hands of those immediately interested, believing that its importance demands the consideration it receives.

Hiram Barrus, *Chairman.*

PLYMOUTH.

From the Report of the Committee.

The exhibition of sheep seems to have exceeded those heretofore, both as to number and quality. Your committee believe sheep husbandry is beginning to be better appreciated by our farmers; we are quite sure no stock is so profitable.

Contrast, for instance, the dairy stock; take into account the choice feed which is requisite to do any thing like a successful business, and the daily routine of work and never-ending labor, with our dry and almost barren fields—the slight care and oversight of a flock of sheep, which are at pasture the greater part of the time.

The reason why sheep have become so nearly extinct in many parts of our county, is mainly the ravages of dogs in past years, but under the present law, we have little to fear. And we hope yet to see our waste lands and old fields stocked with sheep as in former times. But the law should be that no dog shall run at large without his master.

We sometimes hear objections urged against keeping sheep, that the wool does not command the price it formerly did. That is very true; yet the increasing demand and ready market in our cities and villages for early lambs, more than makes up the deficiency on the fleece. At no time was there ever greater encouragement for a farmer to engage in this branch of business.

Those of us who keep sheep know full well the tempting prices offered for our choice lambs, which we have decided to keep to replenish our flocks.

Mr. Davis's sheep are of the Oxford Down variety, which is a new breed, now highly prized in England, made out of a cross between the South Down and Cotswold. They are smaller than the Leicester—are more prolific, nurse better, make better mutton, and are supposed to be better suited to our soil and climate. The Leicester may be more profitable to the butcher, but requires more care. It is questionable whether the pure Leicesters would maintain their size and thrift on our soil. Under the head of flocks of sheep, the committee understand wethers, bucks and ewes, of a year or over, to be included.

Ephraim B. Thompson, *Chairman.*

POULTRY.

MIDDLESEX.

From the Report of the Committee.

The committee on poultry are gratified at the increased attention which is being paid to this kind of stock, by a portion of our intelligent and enterprising farmers, believing, as we do, that no other farm stock yields so large a per centum of profit, or affords more pleasure in the rearing.

There was a less number of fowls on exhibition at the late fair, than on some former occasions, (owing, probably, to the inclemency of the weather,) but those that were presented were of great excellence, and reflected much credit on the exhibitors. A breed of fowls, in order to commend itself to the attention of the farmer, should possess several qualifications not always found in the poultry yard.

1. It should come to maturity early. It is evident that a pullet which commences laying at four months of age, is of much greater value than one which yields no income till eight months have expired; and chickens which are fit for the market in July and August, command a much higher price than those which do not arrive at maturity till November.

2. The hens should be good layers, and at the same time possess tender and juicy flesh, in order to fulfil the requirements of the table.

A breed of fowls possessing these qualities will always, with good care, yield large profits, and afford great satisfaction in the rearing; always affording the means of furnishing the table with food that is delicate and also nutritious.

J. B. Farmer, Esq., to whom the committee award the highest premium, seems to have succeeded, by judicious crossing, in obtaining a flock of fowls which combine all the required excellencies. They are of medium size, and come to maturity at four months of age; are excellent layers, and the chickens, when dressed, command the highest market prices. His fowls are a mixture of the White Dorking, White Shanghai, and Black Spanish breeds.

Your committee will not here discuss the merits of the different breeds of fowls, as they believe more depends on the management than on the breed. They will simply suggest, however, that when eggs alone are the object, the Black Spanish is an excellent variety, as the hens seldom desire to sit.

If one desires to rear chickens for the market, as well as to be supplied with eggs, the Dorking would be a good breed; or a mixture of the Dorking or Black Spanish with the common native breeds would produce desirable results. But *any* breed, with proper attention, will produce a profit; while no fowls, if neglected, will yield enough to pay the keeping and trouble. In looking over the statements of the exhibitors, we find that the profits on well managed flocks of poultry are very large; in some instances amounting to three or four hundred per cent. on the capital invested. It is not always possible to make so large a profit as this, but your committee are satisfied from having kept accurate accounts for series of years, of the expenses and income of a flock of fowls, and from information derived from others who have done the same thing, that one dollar profit may be made on each hen kept, if the flock does not exceed fifty in number. And this may be done every year with only ordinary care.

Where very large flocks have been kept together, the profits have been less; and we would recommend that in case more than fifty are kept, that the flock be divided; in which case we have no doubt but that one dollar would be the minimum annual profit on each hen; which, calling the value of the hen fifty cents, would be *two hundred per cent.* Does any other branch of farming pay so large a per centum of profit? If it does, we have yet to learn what it is. But it may be asked, why more people have not engaged in poultry-rearing, if it is so profitable? The truth is, that comparatively few people have made it profitable, which does not seem strange to those who know how a large number of farmers and others, have managed the business. Those who do *not* make it pay, may be divided into two classes.

1. Those who, a few years ago, were afflicted with a peculiar disease, known as "hen fever," which affected the pockets more than other parts of the system, causing that organ to contract in direct ratio to the intensity of the fever. It is not

strange that those who paid Burnham $25 per pair for fowls whose chief recommendations were long legs and outlandish names, should find, in the end, that the profits, like the "extended" liquors of the celebrated ex-commissioner, were somewhat *diluted.*

2. That large class of farmers and others, who keep a few hens and turkeys more from the force of habit than from any other cause, and who adopt as their rule of action the maxim that all creatures should "cut their own fodder." Consequently their fowls are allowed to shift for themselves, and to ramble in whatever direction they please; and being conscious of the fact that they have got to "scratch for a living," they set about it with commendable zeal, helping themselves to every thing that comes in their way, never stopping to discriminate in favor of the young cabbages, or to consider the havoc they are making with the newly raked onion bed; and laying their eggs where it is not always convenient for their owner to find them.

In winter, the only protection given them is often an open shed; and their feed is dealt out when it best suits the convenience of the master. Hence, they eat voraciously when they *do* get any thing, and the eggs they lay are few and far between. This class of people generally consider fowls a nuisance: and they are so to *them*, and the sooner they get rid of them the better. These same persons would not turn a fine cow out into the cold and sleet, and feed her once a day or twice, as happened most convenient, and then expect her to yield the same quantity of milk that she would in a warm barn, with an ample and regular supply of feed. Why should they expect more of a hen than they do of a cow? And yet you will hear these persons grumbling that their poultry does not lay as well as that of their neighbor. If they would go to their neighbor and find out how he manages, and bear in mind the maxim of Franklin, "No gains without pains," and believe that even they themselves can learn something, they might succeed better. But as they belong to the class of anti-progressives, who know enough already, perhaps this is too much to expect of them.

We can see no good reason why not only every farmer, but also every mechanic and laborer, of ordinary intelligence, who owns enough land for a poultry yard, should not have a flock of poultry, and make it profitable. The capital necessary to start with, is within the reach of almost every one, and in almost every family there is enough refuse food to feed a flock of twenty fowls. The rearing would not only be a source of profit and pleasure to the family, but would place at their command a most desirable dish in warm weather, viz.: a tender chicken, and be one of the best means, in our judgment, of elevating themselves and families in the social scale. For the benefit of this class of people, and all others who may wish to enter upon the business of rearing poultry, we propose briefly, to give a method of feeding and management, which we think will insure success, provided the person who undertakes it possesses a reasonable amount of intelligence and common sense.

1. It is essential that poultry should have pure air. Too many should not be kept together, and the hen-house should be well ventilated; having a southern exposure, if convenient; and there should be as many windows as possible in the south side, for the admission of the sun in winter. There should also be a large yard connected with the house, where the fowls should always be permitted to go in moderate weather.

2. Pure water should be accessible to them at all times; the inside of the house should be kept well white-washed; the floor—which should always be ground—should be spread frequently with a coating of loam or meadow muck; and ashes or sand should be furnished at all seasons of the year for the fowls to wallow in.

3. Avoid breeding in and in, and do not keep fowls that are more than two years of age, except for the purpose of rearing chickens.

4. In rearing early chickens and turkeys, be careful to guard them from exposure to cold and wet when young.

5. The feed of poultry is a matter of great importance, and much might be said in relation to it, but we shall be obliged to touch upon it very lightly, as this report is already much too long.

We would say, first, give them the potato peelings, crumbs, &c., from the table, and, in fact, all the refuse food, that is usually thrown to the hogs. In addition to the above, furnish fowls that are being fattened, with a liberal supply of corn; and those that are intended for laying, with little or no corn, but with oats, wheat screenings, barley, and some animal food, as scraps, young veal, &c. Also give them oyster shells pounded fine, or lime in some other form, and allow them to ramble a portion of each day at least, to eat grass, &c. It is a well known fact to all successful poultry raisers, that a hen fed exclusively on corn, while she will fatten readily, will lay very few eggs. The reason is obvious. Corn is composed largely of starch, which is a fat producing element, and is deficient in the nitrogenous substances of which the egg is mainly made up. Hence, the hen fed on corn, lays on fat, but does not yield eggs, simply because the corn does not contain the requisite material. And, on the other hand, the hen which is fed on oats, animal food, &c., which yield a large per cent. of nitrogenous substances, will generally lay freely, because she has the requisite "where-with-all" for that purpose. But she will never become very fat, unless corn or some other fat producing feed be added to the diet. It is not desirable, however, that a laying hen should be very fat. A flock of poultry, fed in the above manner, will produce fat or eggs, just as the owner desires, and cannot help themselves. It has been determined, by experiment, that fowls which have feed by them all the time, consume less than when fed at intervals, and your committee would therefore recommend a constant supply.

If the policy which we have indicated above be adopted, we are confident in the belief that the fowls will be at all times free from disease, and that all who give poultry rearing a fair trial, will find the results to be satisfactory.

J. B. Brown, *Chairman.*

Concord, September, 1869.

THE DAIRY.

WORCESTER.

From the Report of the Committee.

We have a home market insufficiently supplied by our own producers; butter made at our own door presents a more inviting appearance to the purchasers than that which has borne the heat and the jolting of a long carriage. Always, purchasers are in our hall as ready to give the highest price as they are desirous of purchasing the best article.

Much butter is offered in the market at a shilling the pound; and it would seem as if, when to the actual value of the article in the market the society adds by way of premium an amount varying from seventeen to fifty cents per pound, it had done all it could be expected to do to secure a spirited and general competition. So much has been written upon the subject of the manufacture of butter, that no hope is indulged of adding by way of remark, any information to what would seem to be a well told tale.

In spite of all that has been said, at every exhibition of the kind, competitors fail of success, when it would seem defeat could be most easily guarded against. Thus, for instance, at our present exhibition, more than one competitor failed for want of thoroughly extracting the buttermilk from the butter.

In answer to the inquiries prepared by the society, one exhibitor states that he works his butter by hand, and all state that they do not make use of any labor-saving machine in the manufacture of this article.

The committee do not mean to hazard the assertion that *good* butter cannot be *worked* by *hand* and remain *good;* but they do make the safe statement that all butter if worked by machinery is *better* than if worked by hand.

Good cows, good feed, pure water, the utmost cleanliness, all agree are essentials to the manufacture of good butter. Differences exist as to the time requisite for churning. But it is believed that more depends upon the mode in which this process is performed, than upon the time consumed in the operation; and perhaps, after all, the temperature of the cream at the time of churning is of quite as much importance as either of the other points. The writer has found, by his experience, these two propositions to be true,—first, the warmer the cream the quicker it is churned, and, as a general rule, the quicker the churning, the poorer, that is the softer and more oily, the butter. After the churning, the next point is the salting. And here the committee would repeat, that some of the lots were much injured by the excess of this article. Not only was it present in excess, but of such size as to grate between the teeth. Bearing in mind that the consumer can easily supply a slight deficiency, while it is impossible for him to subtract from the amount already incorporated in the butter, all will agree that it is preferable to use too little than too much salt. Besides, a large supply of this article rather detracts from than adds to the true flavor of butter. As a rule it is thought that not more than one pound of salt should be added to twenty pounds of butter. If, when the butter has come in the churn, the buttermilk is well worked out, this amount of salt is well incorporated in the mass, and the whole left in a cool place for twenty-four hours, and then again well worked by the "*Butter Worker*," and lumped for market, a really good article is not produced, it may be set down for certain, provided the consistency of the butter shows a proper mode of churning, that the fault lies elsewhere than in the process of manufacture.

Subsequent to the examination and award of premiums by the committee, two other boxes of lump butter, marked nine and ten, were placed in the hall of the society. These were examined by a portion of the committee, and in their opinion, would have received a premium had they been seasonably entered with the secretary. Both lots were well made, and of high flavor and fine consistency, and the committee regretted that the owners had failed to comply with the rules of the society.

Among the implements which filled the halls of the society, the attention of the committee was called to one, around which was gathered a highly gratified crowd of spectators. This was a Butter Table or Butter Worker, manufactured and exhibited by Nourse, Mason & Co., of Boston and Worcester. It consists of a slab of maple, raised a little at one side, upon which rests a fluted roller revolving upon a wooden shaft, one end of which is secured to an upright pin at the lower edge of the platform or table. Laying the butter upon this table, and passing the roller backwards and forwards over it, it is rolled out into a thin sheet, which is turned up and lapped together and rolled out again, till every particle of buttermilk is separated, and the butter more thoroughly worked than in any other possible mode. By the same implement the salt may be incorporated with the butter more easily and thoroughly than by any other process.

From a long experience in its use, the chairman would recommend every proprietor of a dairy, who is desirous of manufacturing a superior article of butter, to supply himself with one of these "*Workers*." Thereby he will assure to himself, with the recurrence of every churning, the blessings of her who is above all the great essential in the manufacture of this article of universal use.

William S. Lincoln, *Chairman.*

As a matter which may be of interest, the following comparative table has been made from the statements of the several competitors for the premium on butter.

The period of trial was from the 1st of June to the 10th of September, 1860. The animals in all instances derived their support from pasture feed. In one instance the practice was adopted of keeping the animals in the barn over night.

No statement is given of the process of manufacture.

The owner of Lot 2,	from	5	cows,	made	293 lbs. butter.
3,	"	4	"	"	400
4,	"	8	"	"	602
5,	"	9½	"	"	732½ and 234 cheese, or 78 butter.
6,	"	6	"	"	715
7,	"	4¼	"	"	254
8,	"	4	"	"	336

HAMPDEN.

Statement of Mrs. James Wallace.

Butter.—My butter was made and put down the first week in June, 1860, from two cows, one a half Devon and native, the other one-quarter Ayrshire and native. Feed common pasture.

The milk and cream churned together, milk standing twenty-four hours before churning. Churned in Kendall's rotary churn; time churning from fifteen to twenty minutes, temperature regulated by the finger, (the best thermometer,) if too low I add a little hot water. My reason for churning milk and cream together is, that the butter is less oily to the taste. When taken from the churn, the butter is washed in cold water with a ladle until all the buttermilk disappears, then salted with one ounce and a half salt per pound, and worked until all the water is expressed. When the jar is full, I place a cloth, thickly strown with salt over the top to exclude the air. Butter thus made and put down will keep any length of time, if placed in a cool cellar, free from foul air. Butter made in this manner is well known to the English navy, and carried by them, and, after a five years' cruise, has proved to be as sweet as when shipped. The butter made and sold from these two cows, from January to October, was one hundred and seventy pounds, beside supplying a family.

BEE CULTURE.

HAMPSHIRE.

From the Report of the Committee on Bees and Honey.

Is it best to keep bees? I answer yes, it is both profitable and instructive to raise bees and honey, if properly managed. An ordinary share of good common sense, with a little experience, are the only outfits needed, for commencing the experiment. I said it was profitable and instructive, this matter of bee-making. The market sales of honey and bees-wax, and the delicious luxury afforded for the table, are evidences of profit, while the lessons that may be learned, and the pleasures experienced by watching and studying the habits of these industrious workers, affords a true source of pleasure and recreative instruction. Besides, a row of bee-hives, and a tidy, neatly constructed apiary, are ornaments to the household premises. In fact, a farm-yard is hardly perfect without them. I am not about to write a treatise upon bees, and bee-keeping. There are quite enough of these already. I shall aim at being *practical* in what I have to say, and confine myself to a few simple, pertinent suggestions, that I think may meet the wants of those who wish to keep bees with economy and profit, without incurring much expense for either imported bees or patent hives.

THE BEE-HIVE.—Do not enter largely into the trial and experiment with patent hives. It will not pay. Sporting gentlemen, and fancy farmers who have ample means and plenty of cash to spare, can afford to try the experiment of testing and becoming disappointed with patent hives. But farmers of moderate means, I ask you *to make your own*. You can make just as good a hive, and one that will answer every purpose of the costly patent one. You can make a hive that will save the bees, and give you the honey they do not need, and this is all that a ten-dollar patent hive can do. I object to most patent hives, on these grounds. *There are too many kinds*, quite as numerous as patent churns and washing-machines. They are *too costly* for general use. They are *too complicated* in their construction, having as many labyrinths and angles as a diagram of a proposition in geometry. And again, they are *no better than a simple, unpatented article*, that every farmer can make with a plane, saw and hammer. I advise you not to buy largely of patent hives, but to make your own. And I will tell you how ; perhaps you know already as well as I do.

The hive that answers all purposes, and the one that I would recommend, is the common oblong box-hive, with a chamber and drawers in the top. It should be made large enough in the lower part to hold plenty of honey for the winter consumption of the colony. The chamber above should be of sufficient size to contain two drawers that will hold the surplus honey that the bees do not need. All the joints of the hive should be perfectly tight, so as to afford no lurking place for the bee-moth or vermin. The drawers should be alike, and completely fill the chamber. A movable pane of glass should constitute the end of each drawer. The chamber should be closed by a sliding-door, or a panel with hinges. Each drawer should communicate with the lower apartment by a hole in the centre of the bottom, an inch or more in diameter. This hole should be closed with a piece of tin, until the bottom of the hive is filled with honey. In no case should the bees be permitted to make honey for the use of their owners until they have filled their own store-house with a winter's supply. The above described hive is equally as good as a ten-dollar patent one, and will cost but a trifle. It affords a chance to get the surplus honey without destroying the bees, and this is the only commendable advantage of any of the patent articles.

THE BEE-HOUSE.—Where is the best place to set the hives? Some prefer placing them under the shade of a tree, upon a form, without any other covering. Others think it best to arrange them in a house or shed, closely enclosed on three sides, with a roof above. About a middle course is evidently the better way, viz.: a simple roof covering, open on all sides. Bees want plenty of pure, fresh air. They will not thrive without it. A bee-house enclosed on three sides is too close and hot, and will not admit enough air. A simple roof covering is all that is necessary, under which is a form for the reception of the hives. The face of the hive should open to the south, and should be placed, if possible, so that from ten to two o'clock it may be shaded by some tree. All bee-hives, during the summer months, should be elevated from the bottom board on which they stand, at least half an inch. This can be done by placing a wedge of wood under each corner of the hive. Free ingress and egress are thus allowed, also fresh air, and no lodging place for the eggs of the miller.

The drawers should go in on the back part of the hive, so that they can be approached without disturbing the bees, or getting stung by them.

HIVING THE NEW COLONIES.—Young swarms of bees begin to leave the hive, usually about the middle of May. From one to three young swarms go out in the course of six weeks from a single, well-stocked hive. It requires some considerable tact to hive the young swarms with success. They commonly leave the old hive from between nine o'clock to three o'clock in the afternoon. The day before swarming, they often forsake the hive and hang out in a mass upon the sides or bottom of the hive. Do not be in too great a hurry to secure them after they alight; go to work steadily; there will be plenty of time. Place a table under the limb on which they have alighted, spread over it a clean, white cloth, a sheet or table-cloth will answer the purpose well. Place upon this a couple of pieces of slit-work, about ten inches apart, upon which to elevate the hive. Now take firmly hold of the limb while an assistant saws it cleanly off. Place it with gentleness upon the table between the two billets of wood and put the hive over them. Now cover the hive with a second sheet and then leave them ; they will soon go up into the hive. It is well to rub the inside of the hive with salted water or green walnut leaves, before hiving the bees. They take to it sooner, and more kindly. At nightfall place the hive with much gentleness where it is to remain during the summer. The drawers should be closed in the new hive until the lower department is filled. The hives should not stand out of doors during the winter season in these latitudes. They should be removed into a warm, dry, unoccupied out-house or kitchen cellar, away from the wind and winter storms. When the spring opens, and the first flowers begin to appear, or even in sugaring time, when they can have access to the sap of the sugar-maple, place them again in the bee-house.

Hunting Wild Bees.—I approach a subject upon which I have never seen any thing written. It is well known that our forests are the homes of many swarms of wild bees. They go off from the domesticated colonies, and seek refuge in the hollow of some good old tree, and there deposit their honey. It requires some experience and skill to hunt wild bees with success. The outfit for bee-hunting is a bee-box, properly constructed with comb and honey, slightly scented with oil of thyme or anise. The box should have a glass in the top or side, covered with a sliding panel, through which the comb and bees can be seen, to admit light. The bee-hunter secures from a bunch of flowers a few wild bees in his box. The panel is now removed, and the light admitted. Or, if he can find no bees upon the flowers, he burns a piece of honey-comb upon a heated stone, the scent of which draws plenty of bees around him. He places the open box near his " altar of incense," and the bees soon alight upon the honey-comb, and begin to feed. Having in one of these two ways secured a few working wild bees, he places the open box upon a high stump, and sits down leisurely to watch them. The bees having supplied themselves with a freight of honey, depart for home. Rising from the box, they fly in circles about it, and then take a bee-line or straight course for the bee-tree. Now comes the hunter's coveted opportunity. He wishes to get the "line of the swarm," as it is called. With a practiced eye, he watches the bees until they are beyond his sight, and finally determines by their unerring course, the direction of the bee-tree. Having "got the line," he closes his box on the bees, and moves on toward the "bee-tree." He then takes a new stand, and makes new observations, and thus gradually nears the wild colony, searching all the while for them in every hollow tree, until he at last discovers their retreat. An experienced bee-hunter having once got the line of a swarm, seldom fails of finding it. Large quantities of honey have often been found deposited in the capacious hollows of some of our forest trees. The sport of bee-hunting, setting aside the honey, amply compensates for the time devoted to it, as a pleasant and healthful recreation.

Uses of Honey and Wax.—Honey affords for the table one of the most delicious luxuries. Bread and butter and honey, why, it makes one's mouth water to write about it. No dessert can be named more delectably palatable and rich. Boiled with water and spices, and fermented, it makes metheglin, a choice medicinal drink. It also enters largely into many of the choicest medicaments of the apothecary, and is highly esteemed among medical men as a valuable article of the materia-medica. Bees-wax, made from the honey-comb, is also very valuable for many purposes. What house-wife or seamstress could possibly get along without her ball of white wax, for polishing furniture and smoothing thread and silk? It is also used in the laundry, and by the tallow chandler. It enters into the composition of many famous salves and unguents. The nurseryman uses it in preparing his grafting-wax, and the dentist in taking impressions for setting artificial teeth. It would be impossible to name here all the uses to which honey and wax are applied.

The Moral of Bee-keeping.—We cannot close our subject without a few "inferences," as the clergy say, "drawn from the habits" of bees. From their well known diligence comes one of our pleasantest proverbs, "As busy as a bee." They commence their work early, and pursue it unremittingly through the day. They never stop to play, or lounge among flowers, nor to fight, unless in self-defence. They well deserve the sweet lines of the poet in kindly mention—

> " How doth the little busy bee
> Improve each shining hour."

We learn from these well known habits of the bee, that it is best to " Work while the sun shines," and that " Diligence is the life of business." At a certain season, a portion of the bees become of no farther use, and they are destroyed and turned out of the hive as drones and pests of the colony. We learn by this, that drones and lazy people are not to be tolerated, and that those who " will not work, ought not to eat." We should hardly like to carry the discipline quite as far as the bees do, and destroy them, however. Again, if meddlers hang around the hive and tantalize the busy workers, as they turn away, they often feel a " sting behind." We learn by this that it is always best to " mind our own business."

SYNOPSIS OF MR. ROOT'S STATEMENT.—Mr. Root has tried several patent hives, but prefers among them, Colton's patent. The chief difficulties in keeping bees and managing them successfully, are—*wintering them*, *getting them in a condition to swarm early*, and keeping them free from the *bee-moth*. Bees want plenty of fresh air. They do not die from cold or frost, but from want of air. The moisture in the hive freezes in cold weather, and makes ice between the layers of comb, and keeps the air from the bees. This happens oftenest at the bottom of the hive. To remedy this evil, he vents his hives in the middle, so as to let in plenty of air. Few bees treated in this way will die, and the colony will be in good condition to swarm early, if they winter well. He has never lost a swarm of bees by moths in twenty years' experience, keeping from ten to twenty swarms annually. To keep off the moth, he planes or scrapes the bottom board in the spring and gets off all the cement and comb that makes a lodging place for the eggs of the miller. He also keeps the board clean, by daily brushing during the spring. After the comb is covered, there is no danger from vermin. He sets his hives in the open air, without any bee-house of any kind.

DAVID RICE, *Chairman.*

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ERRATA

IN THE SECRETARY'S REPORT.

Page 103, 12th line from top, for "discarded" read—descended.
Page 103, line 16, after "those" insert—held.
Page 184, line 19, omit comma after "Island."
Page 188, line 4 of note, after "stable" add—with Sherman Morgan.
Page 198, line 21, for "food" read—feed.
Page 199, line 15, for "ten" read—two.
Page 230, line 37, for "back jumping" read—buck jumping.
Page 233, line 34, after "back" insert—of the shoulder.
Page 235, line 29, after "marks of" insert—the teeth.
Page 274, line 33, for "the society" read—no society.
Page 292, line 22, for "potent" read—patent.

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